Formulation and Evaluation of Anti-diabetic Herbal Extract Preparation

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ABSTRACT

The antidiabetic effect of Aqueous extract of leaves of Ipomoea digitata linn was investigated for antidiabetic activity by In-Vitro α-Amylase Inhibition Activity, by using standard drug Glibenclamide. As the concentration of α-amylase increase the rate of reaction is also increase but the time of reaction decrease because of high concentration of α-amylase will digest the starch rapidly. Glibenclamide is a α-amylase inhibitor agent. As the concentration of Glibenclamide increase the time of reaction is also increase because the number of enzyme required for digest for starch is not sufficient. From the observation it was found that the aqueous extract of dried leaves of Ipomoea digitata Linn having the α-amylase inhibition activity. But as compare to standard drug is less activity but compare to ethanolic extract is having more significant activity. The present paper deals with formulation and evaluation of anti-diabetic activity of tablets prepared from aqueous extract of the selected plant.

Keywords: Anti-diabetic activity, Carbopol, Diabetes, Ipomea digitata,

INTRODUCTION

Herbal Medicine is the oldest form of healthcare known to mankind. Herbs had been used by all cultures throughout history. Many drugs commonly used today are of herbal origin. Indeed, about 25 percent of the prescription drugs dispensed in the United States contain at least one active ingredient derived from plant materia. Some are made from plant extracts; others are synthesized to mimic a natural plant compound. WHO report 80% of the world population relies on the drug from natural origin. A large number of medicinal plants are used in the treatment of diabetes. Diabetes is a metabolic disorder with major complication associated with hyperglycemia, inflammation, foot ulcer, Nerve disorders and sexual depression. Although numerous oral hypoglycaemic drugs exist alongside insulin, still there is no promising therapy to cure diabetes.

So, I believed to select an herbal origin drug for this project because of Less toxicity, Better therapeutic effect, Good patient compliance and Cost effectiveness are the Reasons for choosing drug from natural origin. The genus Ipomoea consists of about 150 species of which are used globally in traditional medicine to treat different ailments, such as a good hypoglycemic, anti-inflammatory, anticonvulsant, and aphrodisiac agents. So it was very interesting to select this plant which can help in the treatment of diabetes along with its major complication of the disease. Considering the above mentioned findings it is It is observed that Ipomoea digitata have been less explored. Hence, the current study was performed to evaluate the, In-vitro anti-diabetic potential of Aqueous extracts of Ipomoea digitata

MATERIALS AND METHODS

The leaves of the plant were collected from the leaves of Ipomoea digitata were collected from Nallamala forests of Andhra Pradesh, India in the month of September 2012. were air dried until free from moisture. Then they were subjected to size reduction to get coarse monodisperse powder of desired particle size. The powdered drug was subjected to extraction with Pet-ether, ethanol and Aqueous in a Soxhlet extractor, temperature was maintained on an electric heating mantle with thermostat control. The extracts were then concentrated to 3/4th of their original mass using rotary vapour apparatus. The concentrated extract were then transferred to a china dish and evaporated to remove excess solvent and allowed to dried in a dessicator till it is free form moisture. The plant extract was mixed with the excipients and compressed into tablets by using Ethylcellulose, Carbopol, Microcrystalline Cellulose, polyethylene Glycol Dibasic Calcium Phosphate, Methylparaben which were procured by Vijay Chemicals Pvt. Ltd – Hyderabad, Andhra Pradesh – India. The details of the composition was given in table no 1.

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The plant extract was mixed with the excipients and compressed into tablets. The tablet parameters observed are given in table 2. The tablets were compressed at the specified weight (400mg). The maximum weight variation of the tablets was ± 2.71%, which falls within the acceptable weight variation range of ± 5%, hence the tablets of all batch passed the weight variation test. Hardness for tablets of all batches was in the range of 4.0 to 4.2kg/cm², which falls above the limit of not less than 3.0 kg/cm². Friability value for tablets of none of the batch was more than 0.87%. The thickness of the tablets of all the batches was found in the range of 3.4 - 3.7mm² indicating fairly acceptable tablets. Disintegration time is an important parameter of tablet. An ideal tablet should disintegrate within 15min. The tablets of all the batches disintegrated within 13minutes 30 seconds.

### Table 3: Observation of aqueous extract of leaves of Ipomoea digitata Linn on α-amylase inhibition activity

<table>
<thead>
<tr>
<th>Tube</th>
<th>Amylase solution</th>
<th>Buffer solution pH 6.8</th>
<th>Time-until Starch disappear</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 ml tube 1 + 0.5 ml starch solution + 0.25% AEAN solution + 0.25% AEAN solution</td>
<td>20 drops</td>
<td>20 drops</td>
</tr>
<tr>
<td>2</td>
<td>1 ml tube 1 + 0.5 ml starch solution + 0.5% amylase solution</td>
<td>20 drops</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>1 ml tube 1 + 0.5 ml starch solution + 1% amylase solution + 1% AEEI solution</td>
<td>20 drops</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>1 ml tube 1 + 0.5 ml starch solution + 2% amylase solution + 2% AEEI solution</td>
<td>20 drops</td>
<td>23</td>
</tr>
</tbody>
</table>
As the concentration of α-amylase increase the rate of reaction is also increase but the time of reaction decrease because of high concentration of α-amylase will digest the starch rapidly. Glibenclamide is a α-amylase inhibitor agent. As the concentration of Glibenclamide increase the time of reaction is also increase because the number of enzyme required for digest for starch is not sufficient. From the observation it was found that the aqueous extract of dried leaves of Ipomoea digitata Linn having the α-amylase inhibition activity. But as compare to standard drug is less activity but compare to ethanolic extract is having more activity.

CONCLUSION
The leaves of plant Ipomea digitata Linn. Belonging to the family Convulvulaceae was taken up for the present study and investigated for the phytochemical screening, formulation of tablets and antidiabetic activity of the leaves extract of the selected plant. Present study deals with formulation and evaluation of the tablets made from aqueous leaves of Ipomea digitata Linn. Exhaustive extraction of the plant material was done with water, acetone, ethanol and petroleum ether separately and the extracts were screened for the presence of various pharmacological active phytoconstituents. Moreover, the leaves Aqueous extract was formulated as tablets using different polymers viz., carbopol and ethyl cellulose. Six batches of the tablets were prepared. From these six batches, two batches Viz. F3 and F6 were found to be the best formulations in terms of the disintegration time taken. And therefore, these two formulations were selected for antidiabetic activity. Finally the anti-diabetic activity was reported which was found to be significant. In addition to this, these studies also provide information of possible mechanism of action of the drug. Thus, this holds great promise for future research for the formulation of potent antidiabetic drug for the present plant.

REFERENCES

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