Abstract
The aim of the present study was to evaluate the glucose lowering efficacy of methanolic and aqueous extracts of leaves of *Prunus persica* using oral glucose loaded normoglycemic rat model, alloxan induced diabetic rat model and inhibition of intestinal glucose absorption by everted gut sac model. Diabetes mellitus [DM] is a group of heterogeneous disorders in which carbohydrate metabolism is reduced while that of proteins and lipids are increased. Hyperglycaemia is a common end point for all types of DM and is an important parameter to evaluate the efficacy of antidiabetic drugs. The results shows that in case of everted gut sac model, both methanolic and aqueous extracts showed significant results at p<0.01 and p<0.001 respectively compared to control. In oral glucose loaded normoglycemic rat model administration of test drug at different doses and at different dosing intervals were administered to evaluate the glucose lowering efficacy. Acarbose was used as reference standard in all models. The results revealed that there is suppression of postprandial spike initially and later maintenance of blood glucose levels were noticed. In case of alloxan induced diabetic rat model blood glucose levels were estimated on 7th and 10th day after alloxan induction. The results showed that the percentage reduction of blood glucose for methanolic extract 500mg/kg on 7th day and 10th day was 49.58 and 69.27 respectively. In case of Aqueous extract the percentage reduction of blood glucose on 7th and 10th day was 42.83 and 55.26. Hence the present study clearly demonstrated the antihyperglycemic activity of leaves of *Prunus persica*

Keywords: *Prunus persica*, Diabetes mellitus, Acarbose, Hyperglycemia, Alloxan.

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INTRODUCTION

Diabetes mellitus [DM] is a group of heterogeneous disorders in which carbohydrate metabolism is reduced while that of proteins and lipids are increased. Hyperglycaemia is a common end point for all types of DM and is an important parameter to evaluate the efficacy of antidiabetic drugs. The hallmarks of DM are three “polys”: an excessive urine production (polyuria), an excessive thirst (polydipsia) and an excessive eating (polyphagia) [1].

Herbal drugs play a major role of all the officially recognized systems of Health in India such as Ayurveda, Yoga, Unani, Siddha, Homeopathy and Naturopathy, except Allopathy. The World Health Organization (WHO) estimates that 80 percent of the population of some Asian and African countries presently use herbal medicine for some aspect of primary health care [2].

In diabetes, some herbal alternatives are proven to provide symptomatic relief and assist in the prevention of the secondary complications of the disease. Some herbs have also been proven to help in the regeneration of β-cells and in overcoming resistance. In addition to maintaining normal blood sugar level, some herbs are also reported to possess antioxidant activity and cholesterol-lowering action [3].

Around 75 per cent of people have type 2 diabetes mellitus. The reasons for this are poor nutrition, rising stress levels, an improper metabolism and lack of fitness [4]. In the United States 25.8 million people or 8.3% of the population have diabetes. Of these, 7.0 million have undiagnosed diabetes. In 2010, about 1.9 million new cases of diabetes were diagnosed in population over 20 years. It is said that if this trend continues, 1 in 3 Americans would be diabetic by 2050 [5].

The peach, *Prunus persica*, is a deciduous tree, native to North-West China, in the region comprised between the Tarim basin and the north slopes of the Kunlun Shan mountains, where it was first domesticated and cultivated [6] It belongs to the *Rosaceae* family. It is highly useful in treating inflammatory disorders [7]. Peach leaves are used in the treatment of constipation [8]. Peach leaves possess good antioxidant properties [9].

Antioxidants are used as supportive therapy in the treatment of DM [10] and hypoglycemic plants have been shown to regulate the oxidative complications of DM [11]. Many species of prunus posses antidiabetic properties *Prunus davidiana, Prunus amygdalus* [12,13]. Hence the present study was carried out to evaluate the antidiabetic activity of *Prunus persica*. 

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MATERIALS AND METHODS

PLANT MATERIAL

Plant material used in this study consisted of the leaves of *Prunus persica*, collected and authenticated by Prof. V. Chelladurai, Ph.D., Research officer – Botany, Tirunelveli. A specimen was deposited in the Hindu College of Pharmacy, Guntur.

PREPARATION OF EXTRACT

Preparation of methanolic extract:
The dried leaf powder was packed into soxhlet column and extracted successively with methanol at a temperature not exceeding the boiling point of the solvent.
The extract was filtered using Whatman filter paper (No.1) and then concentrated in vacuum at 40 °C using Rotary evaporator.
The dried extract was labelled as *Prunus persica* methanolic leaf extract (MEPP) and preserved in refrigerator for further use.

Preparation of aqueous extract:
The dried powdered material of leaves of *Prunus persica*, and then boiled in distilled water for 60 min.
The decoction was taken and allowed to cool for 30 min at room temperature (24 ± 5 °C). This decoction was filtered twice and the filtrate was then concentrated in vacuum at 60 °C using Rotary evaporator.
The dried extract was labelled as *Prunus persica* aqueous leaf extract (AEPP) and preserved in refrigerator for further use.

ANIMALS

Wistar male albino rats (150-180 g) were selected for the present study.
The animals had free access to standard rat pellet, with water supplied *ad libitum* under strict hygienic conditions.
The experimental protocol was approved by IAEC (Institutional Animal Ethics Committee) of HCOP (Hindu college of pharmacy).
The study followed all the rules of (CPCSEA) Committee for the Purpose of Control and Supervision of Experiments on Animals. The protocol number is HCOP/IAEC/2013-14/02.
ANTIDIABETIC ACTIVITY

EXPERIMENTAL DESIGN

<table>
<thead>
<tr>
<th>S.No</th>
<th>Model</th>
<th>Parameters</th>
<th>Species, No. Of animals and groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Exvivo – Rat everted sac model</td>
<td>Intestinal glucose absorption</td>
<td>Wistar albino rats, 4 groups, 6 sacs at each interval</td>
</tr>
<tr>
<td>2</td>
<td>Invivo – oral glucose loaded normoglycemic rat model</td>
<td>Blood glucose at different intervals</td>
<td>Wistar albino rats, 7 groups, 6 animals in each group</td>
</tr>
<tr>
<td>3</td>
<td>Invivo – Alloxan induced diabetic model</td>
<td>Blood glucose</td>
<td>Wistar albino rats, 4 groups, 6 animals in each group</td>
</tr>
</tbody>
</table>

1. Effect of methanolic extract of prunus persica (MEPP) & aqueous extract of prunus persica (AEPP) on intestinal glucose absorption by everted sac model

Overnight fasted rats were killed by light ether. The small intestine was washed out carefully with tyrode solution using a syringe equipped with blunt end. The midportion of the small intestine from each animal was used in order to minimize the transport variability of the segments. Intestinal segments (5±0.2 cm) were then everted. The empty sacs was filled with 0.5ml of distilled water, then the sacs were placed inside the beakers containing 60 ml of the tyrode solution which contain respective concentrations of test samples and maintained at a temperature of 37±2 °C. The external medium was continuously bubbled with a gas mixture of 95% oxygen and 5% carbon dioxide during the whole experimental period [14] The prepared sacs were placed in different groups of drug solutions

<table>
<thead>
<tr>
<th>Group</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>control</td>
</tr>
<tr>
<td>II</td>
<td>Acarbose 2mg/ml</td>
</tr>
<tr>
<td>III</td>
<td>MEPP 2mg/ml</td>
</tr>
<tr>
<td>IV</td>
<td>AEPP 2 mg/ml</td>
</tr>
</tbody>
</table>

At respective time points (30 min, 60 min) the sacs were removed from the beakers and the serosal fluid was drained through a small incision into a test tube. At each time interval 6 sacs are prepared inorder to minimize the error and the average values are taken.

2. Effect of methanolic extract of prunus persica (MEPP) on blood glucose levels in oral glucose loaded normoglycemic rat model

Fasted rats were divided into five groups of six animals each. Group I served as control and received 3g/kg orally glucose, group II served as standard and received acarbose 50mg/kg orally...
30 min prior to glucose load, group III received MEPP 500 mg/kg orally at 0min glucose load, group IV received MEPP 1g/kg orally 30 min prior to glucose load, group V received MEPP 1 g/kg orally 60 min prior to glucose load. Blood glucose was determined by small cut at the tip of the tail with surgical blade and drop of blood was placed in glucometer to read the value at respective time intervals of 0min, 30 min, 60 min, 90min and 120 min respectively.

3. Effect of aqueous extract of prunus persica (AEPP) on blood glucose levels in oral glucose loaded rats

Fasted rats were divided into four groups of six animals each. Group I served as control and received 3g/kg oral glucose, group II served as standard and received acarbose 50mg/kg orally 30 min prior to glucose load, group III received AEPP 500 mg/kg orally at 0min glucose load, group IV received AEPP 1 g/kg orally 60 min prior to glucose load. Blood glucose was determined by small cut at the tip of the tail with surgical blade and drop of blood was placed in glucometer to read the value at respective time intervals of 0min, 30 min, 60 min, 90min and 120 min respectively.

4. Methanolic and aqueous extracts of prunus persica at different doses & at different dosing intervals.

Fasted rats were divided into six groups of six animals each. Group I served as control and received 3g/kg glucose, group II served as standard and received acarbose 50mg/kg 30 min prior to glucose load, group III received MEPP 500 mg/kg orally at 0min glucose load, group IV received AEPP 1 g/kg orally at 0 min glucose load, group V received MEPP 1g/kg orally 60 min prior to glucose load and group VI received AEPP 1g/kg orally 60 min prior to glucose load. Blood glucose was determined by small cut at the tip of the tail with surgical blade and drop of blood was placed in glucometer to read the value at respective time intervals of 0min, 30 min, 60 min, 90min and 120 min respectively.

5. Effect of methanolic and aqueous extracts of prunus persica on blood glucose levels in alloxan induced diabetic rat model.

Hyperglycemia was induced by single intraperitonial injection of 150 mg/kg body weight alloxan monohydrate freshly dissolved in normal saline before use to overnight fasted rats. After 48 hrs check the blood glucose levels of each rat and select those rats which show blood glucose more than 300 mg/dl and were used for the experiment. The diabetic rats were divided into 4 groups...
each containing 5 animals each. Group I served as control and received water daily for 10 days, group II received acarbose 50 mg/kg orally daily twice a day and served as control, group III received MEPP 500 mg/kg orally daily twice a day and group IV received AEPP 500 mg/kg orally daily twice a day for 10 days. On 7th day and on 10th day the blood glucose was checked with rite check glucometer respectively.

STATISTICAL ANALYSIS
The data expressed as the mean± SD. Data were analyzed by one-way ANOVA followed by using Dunnetts T test. Instat® (Graph Pad software, U.S.A).

RESULTS
1. Effect of methanolic extract of prunus persica (MEPP) & aqueous extract of prunus persica (AEPP) on intestinal glucose absorption by everted sac model
This study showed that the MEPP at a concentration of 2mg/ml inhibit the intestinal glucose absorption. Acarbose was used as reference standard. For MEPP at 30 min and 60 min interval the % of glucose absorption was 26.13 and 46.09 respectively. Compared to control the methanolic extract showed significant results. Compared to methanolic extract aqueous extract showed better results. Both methanolic and aqueous extracts showed significant results at p<0.01 and p<0.001 respectively compared to control.

<table>
<thead>
<tr>
<th></th>
<th>% of glucose absorption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 min</td>
</tr>
<tr>
<td>Control</td>
<td>79.47±2.83</td>
</tr>
<tr>
<td>Acarbose 2mg/ml</td>
<td>37.48±2.73(^a)</td>
</tr>
<tr>
<td>MEPP 2mg/ml</td>
<td>26.13±2.70(^a)</td>
</tr>
<tr>
<td>AEPP 2mg/ml</td>
<td>21.01±2.83(^b)</td>
</tr>
</tbody>
</table>

n=6, All values are Mean ± sd ‘a’ significant at p<0.01 and ‘b’ significant at p<0.001 compared to control

2. Effect of methanolic extract of Prunus persica (MEPP) on blood glucose levels in oral glucose loaded normoglycemic rat model
The present study showed at 15min after glucose administration the peak of the blood glucose level increased rapidly from the fasting value in case of the control group. MEPP 500mg/kg at
0min glucose load showed that there is significant decrease in the postprandial spike at 30min and there is steady maintenance of blood level at 90 and 120min was observed. Suppression of blood glucose for acarbose at 15 min was observed. In the case of MEPP 500mg/kg at 0min glucose load there is significant reduction in postprandial spike at 30 min was observed. In the case of MEPP 1g/kg 30min prior to glucose load significant reduction of postprandial spike is observed at 15min compared to control. Significant p<0.001 MEPP 1g/kg at 30 min prior to glucose load was observed compared to control group at 15 min time interval after glucose load. Significant p<0.001 MEPP 1g/kg at 30 min prior to glucose load glucose load was observed compared to acarbose.

Table 2: Effect of methanolic extract of *prunus persica* (MEPP) on blood glucose levels in oral glucose loaded normoglycemic rat model

<table>
<thead>
<tr>
<th>Group</th>
<th>0 min</th>
<th>15 min</th>
<th>30 min</th>
<th>60 min</th>
<th>90 min</th>
<th>120 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>control</td>
<td>107±1.41</td>
<td>190.66±4.17</td>
<td>133.5±2.73</td>
<td>118±3.03</td>
<td>96.33±2.80</td>
<td>84.5±1.76</td>
</tr>
<tr>
<td>Acarbose (50 mg/kg) 30 min prior to glucose load</td>
<td>74.5±1.87</td>
<td>118±3.28^a</td>
<td>135.66±5.39</td>
<td>140.83±5.94</td>
<td>141.16±4.16</td>
<td>143.16±4.21</td>
</tr>
<tr>
<td>MEPP (500 mg/kg) with glucose load (O min)</td>
<td>97.33±1.96</td>
<td>172.5±2.25</td>
<td>114.16±1.72^a</td>
<td>92.33±3.26</td>
<td>102.16±3.43</td>
<td>100.5±2.88</td>
</tr>
<tr>
<td>MEPP (1g/kg)-30mins prior to glucose load</td>
<td>84.16±1.47</td>
<td>100.33±1.63^a,b</td>
<td>131.5±2.07</td>
<td>142.66±2.94</td>
<td>133.66±1.21</td>
<td>140.5±1.76</td>
</tr>
<tr>
<td>MEPP (1g/kg) - 60 min prior to glucose load</td>
<td>85.83±2.23</td>
<td>115.5±2.25^a</td>
<td>137.83±3.43</td>
<td>142.33±0.81</td>
<td>143.5±3.01</td>
<td>105.16±2.78</td>
</tr>
</tbody>
</table>

Values are mean ±sd , n = 6 ‘a’ significant p<0.001 compared to control ‘b’ significant p<0.001 compared to acarbose
Effect of aqueous extract of prunus persica (AEPP) on blood glucose levels in oral glucose loaded rats

The present study showed that the blood glucose levels in case of the control group reached maximum peak value at 15 min time interval after glucose administration. AEPP 500mg/kg at 0min glucose load showed that there is significant decrease in the postprandial spike at 60min and there is steady maintenance of blood level at 90 and 120min was observed. In case of AEPP 1g/kg 60min prior to glucose load suppression of glucose spike is observed at 15min time interval after glucose load and steady maintenance of blood glucose was observed at 60 and 90min time interval after glucose load. The significant p<0.0001 for AEPP 1g/kg 60min prior to glucose load compare to control was observed.

Table 3: Effect of aqueous extract of prunus persica (AEPP) on blood glucose levels in oral glucose loaded rats.

<table>
<thead>
<tr>
<th>Group</th>
<th>0 min</th>
<th>15 min</th>
<th>30 min</th>
<th>60 min</th>
<th>90 min</th>
<th>120 min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean±</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>107±1.41</td>
<td>190.66±4.17</td>
<td>133.5±2.73</td>
<td>118±3.03</td>
<td>96.33±2.80</td>
<td>84.5±1.76</td>
</tr>
<tr>
<td>Acarbose (50 mg/kg) 30 min prior to glucose load</td>
<td>74.5±1.87</td>
<td>118±3.28&lt;sup&gt;b&lt;/sup&gt;</td>
<td>135.66±5.39</td>
<td>140.83±5.94</td>
<td>141.16±4.16</td>
<td>143.16±4.21</td>
</tr>
<tr>
<td>AEPP (500 mg/kg) at 0 min glucose load</td>
<td>105.5±2.34</td>
<td>181.16±1.47</td>
<td>137.33±2.42</td>
<td>119±2.82&lt;sup&gt;a&lt;/sup&gt;</td>
<td>121±2.28</td>
<td>117±3.48</td>
</tr>
<tr>
<td>AEPP 1g/kg 60min prior to glucose load</td>
<td>87.66±2.42</td>
<td>125.83±4.49&lt;sup&gt;b&lt;/sup&gt;</td>
<td>144.16±2.29</td>
<td>146.16±2.92</td>
<td>147±2.96</td>
<td>115.16±1.32</td>
</tr>
</tbody>
</table>

Values are means ±sd., N = 6 ‘a’ significant p<0.001 compared to acarbose and ‘b’ significant p<0.0001 compared to control.
4. Methanolic and aqueous extracts at different doses & at different dosing intervals.

In this present study methanolic and aqueous extracts were administered at different doses and at different dosing intervals and the results revealed that the MEPP at 500mg/kg at 0min glucose load suppressed the postprandial spike at 30min time interval after the glucose load but AEPP 500 mg/kg at 0min glucose load suppressed the postprandial spike at 60min time interval after the glucose load. MEPP 1g/kg 60min prior to glucose load and AEPP 1g/kg 60min prior to glucose load suppressed the glucose spike at 15min time interval after the glucose load. Compared to AEPP, MEPP showed better results. The significant p< 0.001 for MEPP 1g/kg 60min prior to glucose load and AEPP 1g/kg 60 min prior to glucose load compared to MEPP 500mg/kg at 0min glucose load was observed. The significant p< 0.0001 for MEPP 1g/kg 60min prior to glucose load and AEPP 1g/kg 60 min prior to glucose load compared to control group was observed.

Table 4: Effect of Methanolic and aqueous extracts at different doses & at different dosing intervals.

<table>
<thead>
<tr>
<th>Group</th>
<th>0 min</th>
<th>15 min</th>
<th>30 min</th>
<th>60 min</th>
<th>90 min</th>
<th>120 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>107±1.41</td>
<td>190.66±4.17</td>
<td>133.5±2.73</td>
<td>118±3.03</td>
<td>96.33±2.80</td>
<td>84.5±1.76</td>
</tr>
<tr>
<td>Acarbose (50 mg/kg) 30 min prior to glucose load</td>
<td>74.5±1.87</td>
<td>118±3.28b</td>
<td>135.66±5.39</td>
<td>140.83±5.94</td>
<td>141.16±4.16</td>
<td>143.16±4.21</td>
</tr>
<tr>
<td>MEPP (500 mg/kg) at 0 min glucose load</td>
<td>97.33±1.96</td>
<td>172.5±2.25</td>
<td>114.16±1.72</td>
<td>92.33±3.26</td>
<td>102.16±3.43</td>
<td>100.5±2.88</td>
</tr>
<tr>
<td>AEPP (500 mg/kg) at 0 min glucose load</td>
<td>105.5±2.34</td>
<td>181.16±1.47</td>
<td>137.33±2.42</td>
<td>119±2.82</td>
<td>121±2.28</td>
<td>117±3.48</td>
</tr>
<tr>
<td>MEPP (1g/kg) - 60 min prior to glucose load</td>
<td>85.83±2.23</td>
<td>115.5±2.25ab</td>
<td>137.83±3.43</td>
<td>142.33±0.81</td>
<td>143.5±3.01</td>
<td>105.16±2.78</td>
</tr>
<tr>
<td>AEPP 1g/kg 60 min prior to glucose load</td>
<td>87.66±2.42</td>
<td>125.83±4.49ab</td>
<td>144.16±2.29</td>
<td>146.16±2.92</td>
<td>147±2.96</td>
<td>115.16±1.32</td>
</tr>
</tbody>
</table>

Values are means ±sd ,N = 6 ‘a’ significant p<0.001 compared to MEPP 500 mg/kg at 0 min glucose load ‘b’ significant p<0.0001 compared to control
5. Effect of methanolic and aqueous extracts of *Prunus persica* on blood glucose levels in alloxan induced diabetic rat model.

The present study showed that there is no decrease in the blood glucose levels in the case of the control group and there is maintenance of steady blood glucose level was observed. Acarbose was used used as reference standard. Blood glucose levels were estimated on 7th and 10th day after alloxan induction. The results showed that the percentage reduction of blood glucose for MEPP 500mg/kg on 7th day and 10th day was 49.58 and 69.27 respectively. In case of AEPP the percentage reduction of blood glucose on 7th and 10th day was 42.83 and 55.26 respectively. Compared to aqueous extract methanolic extract showed better results. The significant p<0.001 for MEPP 500mg/kg and AEPP 500mg/kg compared to control on 7th day and significant p<0.0001 for MEPP 500mg/kg and AEPP 500mg/kg compared to control on 10th day.

Table 5: Effect of methanolic and aqueous extracts of *Prunus persica* on blood glucose levels in alloxan induced diabetic rat model.

<table>
<thead>
<tr>
<th>Group</th>
<th>0th day</th>
<th>on 7th day</th>
<th>on 10th day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>592.83±4.62</td>
<td>592.83±4.62</td>
<td>589.83±4.92</td>
</tr>
<tr>
<td>Acarbose 50 mg/kg</td>
<td>518.16±8.54</td>
<td>274.5±11.11a</td>
<td>164±11.74b</td>
</tr>
<tr>
<td>MEPP 500 mg/kg</td>
<td>555±10.82</td>
<td>279.83±9.68a</td>
<td>170.5±10.21b</td>
</tr>
<tr>
<td>AEPP 500 mg/kg</td>
<td>.16±11.49</td>
<td>410.67±11.31</td>
<td>309.12±11.03a</td>
</tr>
</tbody>
</table>

Values are means±sd N=6 566., ‘a’ significant at p< 0.001 compared to control at 7th day and ‘b’ significant at p<0.0001 compared to control at 10th day.

Fig. 1: Effect of Methanolic Extract of *Prunus Persica* (MEPP) & Aqueous Extract of *Prunus Persica* (AEPP) On Intestinal Glucose Absorption By Everted Sac Model
Fig. 2: Effect of Methanolic Extract of *Prunus Persica* (MEPP) On Blood Glucose Levels In Oral Glucose Loaded Normoglycemic Rat Model

Fig. 3: Effect of Aqueous Extract Of *Prunus Persica* (AEPP) On Blood Glucose Levels In Oral Glucose Loaded Rats

Fig. 4: Methanolic and aqueous extracts at different doses & at different dosing intervals
DISCUSSION

Diabetes mellitus is a metabolic disorder of multiple aetiologies that is characterized by chronic hyperglycaemia with disturbed carbohydrate, fat and protein metabolism [15]. Many diverse therapeutic strategies for the treatment of Type 2 diabetes are in use. The conventional available therapies for diabetes include stimulation of endogenous insulin secretion, enhancement of the action of insulin at the target tissues, oral hypoglycemic agents, such as biguanids and sulfonylureas and the inhibition of degradation of dietary starch by glycosidases such as α-amylase and α-glucosidase [16]. The results of the preliminary phytochemical screening of the test extracts of leaves of Prunus persica revealed the presence of alkaloids, tannins, flavonoids, sapponons and glycosides. In the present study Prunus persica leaf extract was evaluated for its role in glucose transport across the rat everted gut sacs exvivo. It might possible that the active compounds of Prunus persica leaf extract decreased the blood glucose levels by inhibiting the absorption of glucose from the alimentary tract. Therefore it is most probable that active phytochemicals in the leaves of Prunus persica prevented the glucose transit across the gut membrane by reducing the glucose transporter protein activity which might have lead to wash of glucose from the body. The inhibition of intestinal glucose uptake might be due to the presence of the phytochemical constituent namely naringenin [17] GLUT 2, a transmembrane carrier protein of GLUT family, located in basolateral membrane of small intestine, is very efficient carrier of glucose at small intestine level [18].

Fig. 5: Effect of methanolic and aqueous extracts of prunus persica on blood glucose levels in alloxan induced diabetic rat model.
Encouraging data are available concerning effects of flavonoids on inhibiting GLUT 2 and their hypoglycemic effect, Kwon et al[19], Song et al[20], Johnston et al[21]. Although our findings are promising, uncertainties remain. Some investigators suggested that flavonoids decreased glucose uptake by a sodium-dependent pathway via the sodium-dependent glucose transporter 1 SGLT1.

The presence of flavonoids in the leaves of Prunus persica might inhibiting GLUT2, SGLT1 transporters and reducing the glucose absorption across the intestine. In the present study the effect of methanolic (MEPP) and aqueous extracts (AEPP) of Prunus persica on blood glucose levels in oral glucose loaded normoglycemic rat model at different doses and different dosing intervals were investigated and the results suggests that the incretin hormones are released during meals from gut endocrine cells.

They potentiate glucose-induced insulin secretion and may be responsible for up to 70% of postprandial insulin secretion. The incretin hormones include glucagon-like peptide-1 (GLP-1) and glucose-dependent insulin tropic polypeptide (GIP), contribute to insulin secretion from the beginning of a meal and their effects are progressively amplified as plasma glucose concentrations rise [22]

But the results shows that there is significant decrease in the postprandial spike initially and there is steady maintenance of blood glucose level is observed indicating that the test extract might interfering with glucose mediated insulin stimulation and delay in the luminal carbohydrate metabolism might be the reason for maintenance of steady straight line.

Flavonoids are promising alternative for diabetes and its associated complications. However, effective control of not only keeping the blood glucose level optimum will provide better results but compromising continued damage of human islets as well as stabilizing the cellular components is more essential for effective diabetic management [23].

Experimental studies conducted in alloxan induced diabetic rats revealed that orally administered methanolic and aqueous extracts of Prunus persica leaves at doses of 500mg/kg twice daily showed antidiabetic activity. The reductions in serum glucose concentration by Prunus persica may be due to one or a combination of different mechanisms, including modulation of digestion, glucose absorption, insulin sensitivity, or insulin secretion.
CONCLUSION

In the present study, Prunus persica leaves showed significant antidiabetic activity in dose dependent manner. The leaves of Prunus persica may be a new natural source for the treatment of diabetes. When compared to the conventional drugs the herbal plant extracts shows the same effect in a normal physiological way and with least side effects. Further research is needed to find the exact mechanism of action and the chemical constituents that are responsible for the antidiabetic activity.

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