Research Article

# *Invitro* Antidiabetic Activity of Plant Extracts of *Pergularia extensa* chiov

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**ABSTRACT**

This present study is undertaken to evaluate the antidiabetic activity of various crude extracts of whole plant of *Pergularia extensa* chiov. In this current study, the whole powder plant of *Pergularia extensa* chiov was subjected for soxhlet extraction using non polar solvents and cold maceration using polar solvents to obtain the various extracts. This study was carried out by evaluating the percentage inhibition of carbohydrate digesting enzymes such as α-amylase and α-glucosidase. Both the enzymes are the biochemical enzyme markers which can significantly decrease the post prandial increase of blood glucose after a mixed carbohydrate diet and therefore can be an important strategy in management of blood glucose. This bioassay revealed that the methanol extract of *Pergularia extensa* chiov exhibit dose-dependent increase in percentage inhibitory activity on α-glucosidase enzymes and α-amylase. Acarbose was used as a standard drug.

**Keywords:** *Pergularia extensa*, α-amylase, α-glucosidase.

## INTRODUCTION

*Pergularia extensa*[1] commonly called as *Pergularia daemia* or *Daemia extensa* (Fam:- Asclepiadaceae) which is a slender twining perennial herb. It has a foetid smelling laticiferous odour after touch. It has hispid stems, simple, opposite and cordate leaves. Its flowers are greenish or dull white tinged with purple colour. It has corymbose clusters and having axillary long peduncles. Its fruits have refluxed follicules. Its leaves have densely velvety pubescent on both sides. It grows throughout the hotter parts of India upto 900-1000 meters in Himalayas, Ceylon and Afghanistan. It is also medicinally used in Gold coast, Senegambia and Cameroon. The plant is used as a whole in the indigenous systems of medicines.

The leaf and fruit of the plant has medicinal properties such as emetic, anthelmintic, expectorant and antipyretic. The decotion of leaves is used urethrorrhea, amenorrhea, dysmenorrhoea. The root bark is mixed with cow's milk and employed as a purgative[2-3].

The present investigation was undertaken in study of *invitro* antidiabetic activity of all plant extracts obtained from the whole plant.

## MATERIALS AND METHODS

### Plant Material

The whole plant including the root of *pergularia extensa* was collected from the herbal garden of KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada during the month of February 2008.

The plant was identified and authenticated by Dr. S.M. Khasim, Professor, Department of Botany, Acharya Nagarjuna University in Guntur.

### Chemicals

All the reagents used in this study were of analytical grade obtained from S.d. Fine Chemicals Ltd., Mumbai.

### Experimental Procedure

In this *in vitro* antidiabetic activity[4-5], α-amylase and α-glucosidase enzyme was employed as diabetic enzymatic marker. A starch solution (0.1%w/v) was obtained by stirring 0.1g of potato starch in 100 ml of 16 mM of sodium acetate buffer.

Both α-amylase and α-glucosidase enzyme solutions were prepared by mixing sodium potassium tartrate solution and 3,5-dinitro salicylic acid solution 96 mM individually.

Both acarbose and plant extracts were added with starch solution whose concentration is 250µg/ml and left to react with α-amylase solution under alkaline conditions at 25°C. The same is carried out for α-glucosidase enzymatic activity.

The reactions were measured over 3 minutes. The generation of maltose was quantified by the reduction of 3, 5 dinitro salicylic acid to 3-amino-5-nitro salicylic acid. The reaction is detectable at 540 nm. (Temperature 25°C ± 0.1°C, pH 4.8; O.D at 540 nm).

$$\%\ Antidiabetic\ Reaction = \frac{(Maltose)\ control}{(Maltose)\ test} \times 100$$

## RESULTS AND DICUSSIONS

In this study, the methanol extract showed an excellent inhibitory activity against α-amylase and α-glucosidase at 250 µg/ml (Figure 1).

Their percentage of antidiabetic action were found to be 88.37% and 97.67% while the inhibitory action of


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standard, acarbose was found to be 59.38% and 80.77% at 250 µg/ml (Table 1 and 2).

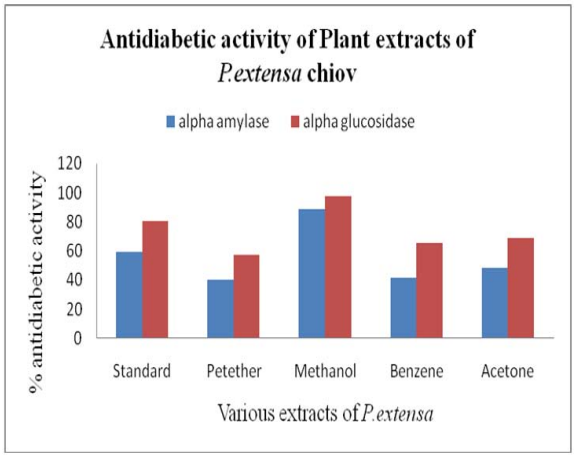


**Figure 1:** Bar diagram showing comparaison of antidiabetic action of various extracts of two biochemical enzymes

**Table 1:** Anti-diabetic efficacy of various extracts on α-amylase inhibitory activity

| Name of the extract (250µg/ml) | Absorbance (nm) | % antidiabetic reaction |
|---|---|---|
| Control | 0.38 | ------ |
| Standard | 0.64 | 59.38* |
| Pet ether | 0.94 | 40.42 |
| Methanol | 0.43 | 88.37 |
| Benzene | 0.92 | 41.30 |
| Acetone | 0.78 | 48.72* |

* denotes significant values (P<0.05) comparing to standard

**Table 2:** Anti-diabetic efficacy of various extracts on α-glucosidase inhibitory activity

| Name of the extract (250µg/ml) | Absorbance (nm) | % Antidiabetic reaction |
|---|---|---|
| Control | 0.42 | ------ |
| Standard | 0.52 | 80.77 |
| Pet ether | 0.73 | 57.53 |
| Methanol | 0.43 | 97.67 |
| Benzene | 0.64 | 65.63* |
| Acetone | 0.61 | 68.85* |

* denotes significant values (P<0.05) comparing to standard

Diabetes mellitus is a metabolic disorder with increasing incidence throughout the world. Insulin is a key player in control of glucose haematosis. Lack of insulin affects metabolism of carbohydrates, fats and proteins[6]. It was proposed that inhibition of α-amylase and α-glucosidase delay the degradation of carbohydrate, which would in turn cause a decrease in the absorption of glucose, as a result the reduction of postpranial blood glucose level elevation[7]. In the present study the methanol extract inhibit both the enzymes namely α-amylase and α-glucosidase very effectively.

## CONCLUSION

The study was aimed to investigate the *in vitro* antidiabetic activity by different models using various extracts.

The methanol extract showed a potent activity than other extracts and the standard. Also the drug had a void folklore use in various areas previously mentioned in the literature survey which are proved to be true.

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