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In-Vitro Anti-Diabetic Studies and *In-Vitro* Anti- Inflammatory Activity in an Underutilised Plant *Epiphyllum oxypetalum* (DC.) Hawthorn Leaves

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Abstract
Medicinal flora is being utilized in healthcare considering the fact that time immemorial. A number of studies have been accomplished to confirm their efficacy, globally in the manufacturing of plant-based medicines. Medicinal plants play important roles in sickness hindrance and their promotion and use work into all existing prevention strategies. However, acutely aware efforts got to be created to properly identify, recognise and position medicative plants within the style and implementation of those strategies. In the present study, the leaves of *Epiphyllum oxypetalum* (DC.) Hawthorn has observed in vitro anti-diabetic and anti-inflammatory activities by treated with methanol solvent.

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INTRODUCTION

The therapeutic properties of various plants are utilized as medicine for several years in the ancient period. Some do appear to figure though there might not be adequate scientific knowledge (double-blind trials, for example) to verify their efficacy. Such plants ought to qualify as healthy plants. Pharmacists and pharmacologists employ the term crude drugs of natural or biological origin to explain whole plants or components of plants with medicinal properties. Herbal remedies have a strong and deep assessment of their medical qualities and safety that are often realized by new biological technologies like pharmacogenomic, metabolomic and microarray methodology. As a result, naturally derived substances over the world, to obtain the entire benefits, are determined through pragmatic studies, which are helpful for society. The various anti-inflammatory drug was shown to scale back pain and inflammation by obstructing the metabolism of arachidonic acid by an isoform of cyclooxygenase enzyme, thereby reducing the assembly of prostaglandin. Sadly, there are several aspect effects related to the administration of nonsteroidal anti-inflammatory drugs. However, there are medicative plants with therapeutic anti-inflammatory effects with low or no side effects. Diabetes could be an illness that affects many of us within the 21st century and is understood because the fifth leading cause of death. High prevalence, variable pathogenesis, progressive process, and complications of polygenic disease all highlight the pressing would like for effective treatments. Different treatments, love hormone therapy, pharmacotherapy, and diet therapy, are out

there to manage diabetes. There are many styles of glucose-lowering medication that exert anti-diabetic effects through different mechanisms.

MATERIALS AND METHODS

Study Area

The Kerala forests have bewildering diversity of floristic composition. So many plants that are either indigenous or naturalized in Kerala are used in the Indian system of medicine like Ayurveda and Siddha. The fresh plant material was collected from Puthiyara, Calicut district of Kerala.In Kozhikode, the wet season is overcast, the dry season is partly cloudy, and it is hot.

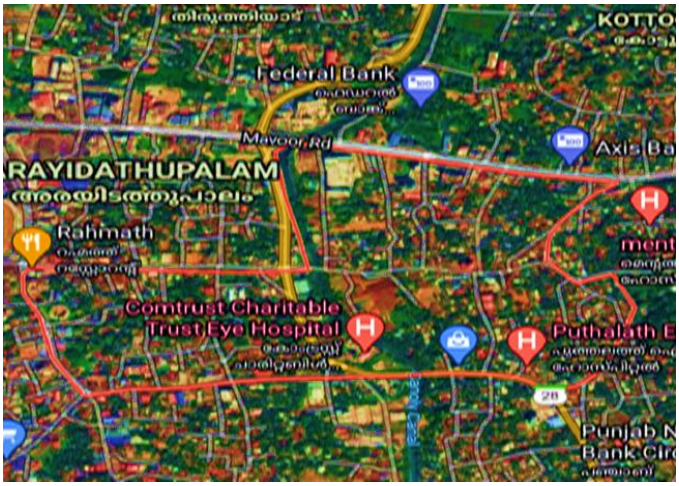

Figure 1: Study Area (Location Map)

Figure 2: Habit of *Epiphyllum oxypetalum* (DC.) Hawthorn

Collection of the selected sample

The plant species *Epiphyllum oxypetalum (DC.) Hawthorn* is a crucial plant in Hindu mythology and also one of the ancient medicines. The fresh material was collected from Puthiyara, Calicut district of Kerala, during October 2020. The leaves are collected, washed well with running water and then rinsed with distilled water. The collected material was shade dried at room temperature. The dried leaves are homogenized to uniform created by fine powder victimization pulveriser.

Figure 3: Dried leaves of the sample and powder

Preparation of extract for phytochemical preliminary test

The leaves are collected washed well with running tap water and distilled water and shade dried at room temperature. The dried leaves are homogenized to a uniform made by fine powder using a pulverizer. The phytochemical components of the *Epiphyllum oxypetalum* (DC.) Hawthorn leaves extracts were prepared by using standard procedures as described by Harborne (1998). The extracts from *Epiphyllum oxypetalum* are prepared using the Soaking method. 25 g of the fresh samples of *Epiphyllum oxypetalum* plant leaves were percolated in 200ml methanol for 24 hours with occasional shaking.

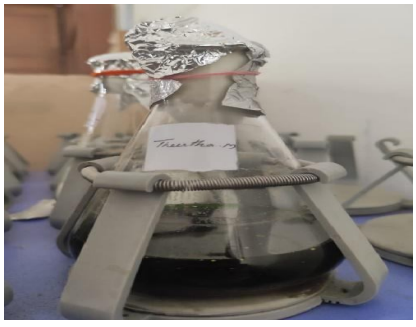

Figure 4: Hexane extract

The extracts were then filtered using Whatman no. 41 filter paper. The organic solvent filtrates were concentrated in a vacuum using a rotary evaporator, and the hexane extracts were dried using a water bath to obtain crude extracts. They were collected and stored for further analysis.

***In vitro* anti-diabetic studies: inhibition of alpha-amylase enzyme**

A total of 500 µl of test samples were added to 500 µl of 0.20 mM phosphate buffer (pH 6.9) containing 500 µl of α-amylase (0.5mg/ml) solution and were incubated at 25°C for 10 min. After these, 500 µl of 1% starch solution in 0.02 M sodium phosphate buffer (pH 6.9) was added to each tube. The reaction mixtures were then incubated at 25°C for 10 min. The reaction was stopped with 1.0 ml of 3, 5 dinitro salicylic acid colour reagent. The test tubes were then incubated in a boiling water bath for 5 min, cooled to room temperature. The reaction mixture was then diluted after adding 10 ml distilled water, and absorbance was measured at 540 nm. Control represented 100% enzyme activity and was conducted. similarly, by replacing extract with standard anti-diabetic drug glimepiride (Nair *et al*., 2013).

Inhibition (%) =

$$\frac{\text{Abs 540 (control)} - \text{Abs 540 (extract)} \times 100}{\text{Abs 540(control)}}$$

***In vitro* anti-inflammatory activity: inhibition of albumin denaturation**

The anti-inflammatory activity of plant extractwas studied by using inhibition of albumin denaturation technique which was studied according to Mizushima and Kobayashi (1968) and Sakat *et al*., (2010) followed with minor modifications. The reaction mixture was consisting of test extracts and a 1% aqueous solution of bovine albumin fraction, pH of the reaction mixture was adjusted using a small amount of 1N HCl. The sample extracts were incubated at 37ºC for 20 min and then heated to 51ºC for 20 min, after cooling the samples the turbidity was measured at 660nm (UV Visible Spectrophotometer). The experiment was performed in triplicate. The percentage inhibition of protein denaturation was calculated as follows

Percentage inhibition =
(Abs Control –Abs Sample) X 100 / Abs control

RESULTS AND DISCUSSION

***In vitro* anti-inflammatory activity of the selected sample**

Parameter	Percentage of inhibition
In vitro anti-inflammatory activity	32%

The methanol extract if the sample shows the presence of anti-inflammatory activity. As per the result, the sample has 32% in vitro anti-inflammatory activity (Figure 5).

***In vitro*anti-diabetic activity of the sample**

Parameter	Percentage of inhibition
*In vitro*anti-diabetic activity	26%

The sample shows the absence of reducing sugar, which implies anti-diabetic activity. The results show 26% in-vitro anti-diabetic activity (Figure 6).

Figure 5: *In vitro* anti-inflammatory activity of the selected sample

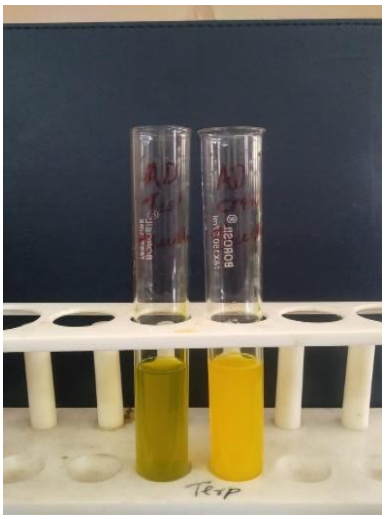

Figure 6: In vitro anti-diabetic activity of the sample

CONCLUSION

Medicinal plants have bioactive compounds that are used for solidifying varied human diseases and conjointly play a very important role in healing. The Medicinal plants have bioactive compounds that are used for solidifying varied human diseases and conjointly play a very important role in

healing. The phytochemical analysis of the plants is incredibly necessary commercially and has a great interest in pharmaceutical firms for the assembly of the new medicine for solidifying varied diseases. It's expected that the necessary phytochemical properties recognized by my study within the indigenous healthful plant are going to be terribly useful within the solidifying of varied diseases phytochemical analysis of the plants is incredibly necessary commercially and has a great interest in pharmaceutical firms for the assembly of the new medicine for solidifying of varied diseases. It's expected that the necessary phytochemical properties recognized by my study within the indigenous healthful plant are going to be terrible.

REFERENCES

1. Chanda S. (2014). Importance of the pharmacognostic study of medicinal plants: an overview. *Journal of Pharmacy and Pharmacology*. 2, 69-73.
2. Harborne J.B (1998); Phytochemical Methods: *A Guide to Modern Techniques of Plant Analysis*, 3rd Ed. New York: Chapman and Hall Int Ed, pp. 234–45.
3. Mizushima, Y. and Kobayashi, M. (1968). Interaction of anti-inflammatory drugs with serum proteins, especially with some biologically active proteins. *Journal of Pharmacy and Pharmacology,* 20, 169-173.
4. Nair, S.S. Kavrekar, V and Mishra, A. (2013). *In vitro* studies on alpha-amylase and alpha-glucosidase inhibitory activities of selected plant extracts. *European Journal* of *Experimental Biology* 3(1), 128-132
5. Obadoni, B.O. Ochuko, P.O. (2001). Phytochemical studies and comparative efficacy of the crude extract of some homeostatic plants in Edo and Delta states of Nigeria. *Global Journal of Pure Applied Science*, 8, 203-208.
6. Olga Erdelska, Florian Stintzing, (2011). Phytochemical and morphological evaluation of flowers and fruits from *Epiphyllum* hybrids during development *Biologia*, 66, Article number: 821.
7. Upendra RS, Khandelwal P (2012); Assessment of nutritive values, phytochemical constituents and biotherapeutic potentials of *Epiphyllum oxypetalum* (DC.) Hawthorn.*International Journal of Pharmacy and Pharmaceutical Sciences,* 4, 421–425.
8. Winrow VR, Winyard PG, Morris CJ, Blake DR. (1993); Free radical in inflammation: Second messengers and mediators of tissue distruction. *British medical bulletin*, pp-.506-522.