

# PRELIMINARY PHYTOCHEMICAL ANALYSIS AND COMPARITIVE ANTI-DIABETIC STUDY OF LEAF AND ROOT EXTRACT OF *CAMELLIA SINENSIS*

KOUSALYA.J<sup>1</sup> & KIRUBA DEVI.V<sup>2</sup> & CHITRA.P<sup>3</sup>

Department of Biochemistry, Sri Ramakrishna College of Arts and Science for Women, Coimbatore-641 044, Tamil Nadu state council for science and technology” (TNSCST).

Received: February 03, 2019

Accepted: March 16, 2019

**ABSTRACT:** The project aims in analyzing the therapeutic properties exhibited by *Camellia sinensis* for treating Diabetes. The phytochemical constituents namely alkaloids, saponins, glycosides and reducing sugars were found to be present in ethanolic extracts of leaf and root of *Camellia sinensis*. These phytochemicals might play a role in inhibiting the enzyme alpha amylase activity. The study shows that root extracts possessed a slightly higher anti diabetic activity when compared to leaf extracts.

**Key Words:** medicinalplants, phytoconstituents, ethanol.

## I. INTRODUCTION:

Diabetes mellitus, a major health problem worldwide is characterized by chronic hyperglycemia, impaired insulin secretion and insulin resistance [1]. According to the International Diabetes Federation and the World Health Organization, 350-400 million people are affected with diabetes [2]. Treatment of diabetes should be focused on a combination of life style changes and pharmacological treatment (Marín-Peñalver *et al.*, 2016). Plants have no side effects and are used in traditional medicines to treat diabetes (Kootiet *et al.*, 2016). *Camellia sinensis*, commonly known as tea and cultivated in India is known to treat various diseases including diabetes (Bhattet *et al.*, 2010).

In the present study an attempt was made to :

1. Analyse the phytochemical constituent's in ethanolic extracts of leaf and root of *Camellia sinensis*
2. To compare the anti-diabetic activity in ethanolic extracts of leaf and root of *Camellia sinensis*

## II. MATERIALS AND METHODS:

### PHASE I

- 1.1 Collection of sample
- 1.2 Preparation of plant extract

### PHASE II

- 2.1 Phytochemical screening
- 2.2 Antidiabetic activity

### PHASE I

#### 1.1 Collection of the plant materials

Fresh leaves and roots of *camellia sinensis* were cut, washed under running tap water to remove all foliar contaminants, dried at room temperature for 10-15 days and pulverized to fine powder. The powdered leaves were weighed separately and stored in container.

#### 1.2 Preparation of extract

About 20 gram of dried powdered leaves and roots were extracted with 140 ml of the solvent ethanol in a Soxhlet extractor. Each of the extract was evaporated to dryness. The extracts obtained were subjected to phytochemical analysis and anti diabetic activity.

### PHASE II

#### 2.1 PHYTOCHEMICAL SCREENING:

The phytochemical namely alkaloids, saponins, glycosides, phenols, tannins, reducing sugars and terpenes were analyzed qualitatively by the method of Trease and Evans (1997) and Harborne (1987). The phytochemical screening of plant extracts were carried out by the method of Trease and Evans (1997) and Harborne (1987). The leaf and root ethanolic extracts of *Camellia sinensis* were screened qualitatively for Tannins by Ferric chloride test, Alkaloids by Mayer's test, Flavanoids by Alkaline reagent test, Saponins by Foam test, Terpenes using chloroform and concentrated sulphuric acid, Glycosides using dilute hydrochloric acid, ferric chloride solution and ammonia solution, Reducing sugar using Benedict's reagent and Phenol using ferric chloride solution

## 2.2 ANTI DIABETIC ACTIVITY

Alpha amylase inhibitory assay was used to assess the anti diabetic activity of leaf and root extracts of *Camellia sinensis* by the modified method of **Bernfeld (1955)**. 200 µl of leaf as well as root extract, 200 µl of porcine pancreatic α-amylase enzyme, 100µl of 200 mM phosphate buffer (pH 6.9), 500 µl of 0.5% starch and 500µl of dinitrosalicylic acid were used. A control was performed along with the test. Recorded the absorbance at 540nm using a spectrophotometer and calculated the percentage of α-amylase inhibition using the formula:

$$\text{Inhibition (\%)} = 100 \left( \frac{\text{Absorbance}_{\text{Control}} - \text{Absorbance}_{\text{Test}}}{\text{Absorbance}_{\text{Control}}} \right).$$

## III. RESULTS AND DISCUSSION

### PHASE:I

#### 3.1 PHYTOCHEMICAL SCREENING:

The present study shows the presence of tannins and phenol in the ethanolic leaf extract. However, ethanolic root extract showed the presence of alkaloids, saponins, glycosides, reducing sugar and phenol. The major bioactive compounds found in plants such as flavonoids, phenols and alkaloids have exclusively protective effect and prevent from various diseases (**Patilet et al., 2017**). The bioactive compounds present in *Camellia sinensis* may contribute to a therapeutic role. **Tariq and Reyaz (2012)** demonstrated the presence of alkaloids, flavonoids, steroids, tannins and phenols in the methanolic extracts of tea.

### PHASE :II

#### 3.2 ANTI DIABETIC ACTIVITY

The anti diabetic activity increased with increase in the concentration of both leaf and root ethanolic extracts. Root extract was found to possess a slightly higher anti diabetic activity. The highest activity possessed by root extract may be due to the presence of phytochemicals namely alkaloids, Saponins, Glycosides and Reducing sugar which is absent in leaf extract.

## CONCLUSION

*Camellia sinensis* leaves and roots contain phytochemicals contributing to anti diabetic activity. Presence of additional phytochemicals namely alkaloids, saponins, glycosides and reducing sugar in root ethanolic extract shows a greater anti diabetic activity compared to leaf extract. This study evidences the benefits of *Camellia sinensis* for treatment of diabetes.

## REFERENCES

1. Bernfeld.P,1951, Enzyme of starch degradation and synthesis, *Advanced Enzymology*. 12,379-428
2. Ettinger LR, Boucher A, Simonovich E,2018, Patients with type 2 diabetes demonstrate proprioceptive deficit in the knee, *World Journal of Diabetes* , 9,3, 59-65.
3. Kooti W, Farokhipour M, Asadzadeh Z, Ashtary-Larky D, Asadi-Samani M.,2016, The role of medicinal plants in the treatment of diabetes: a systematic review. *Electronic Physician*. 8,1,1832-1842
4. Marín-Peñalver JJ, Martín-Timón I, Sevillano-Collantes C, del Cañizo-Gómez FJ,2016, Update on the treatment of type 2 diabetes mellitus. *World Journal of Diabetes*.;7(17):354-395.
5. Ming Zhang , Junmei Zhou , Yu Liu , Xizhuo Sun , Xinpingle Luo , Chengyi Han , Lu Zhang , Bingyuan Wang , YongchengRen , Yang Zhao , Dongdong Zhang , Xuejiao Liu , Dongsheng Hu ,2018, Risk of type 2 diabetes mellitus associated with plasma lipid levels: The rural Chinese cohort study, *Diabetes research and clinical practice*,135, 150 – 157.
6. Patil, A and Modak,M.,2017, Comparative evaluation of oxidative stress modulating and DNA protective activities of aqueous and methanolic extracts of *Acacia catechu*, *Medicines*,65,1-12.
7. Punit R. Bhatt and Kajal B. Pandya, Navin R. Sheth, *CAMELLIA SINENSIS (L)*,2010, THE MEDICINAL BEVERAGE: A REVIEW. *International Journal of Pharmaceutical Sciences Review and Research*,3, 6-9.
8. Tariq. A. L and Reyaz. A. L,2012,Phytochemical analysis of *Camellia sinensis* Leaves, *International Journal of Drug Development and Research*., 4,4,311-316.
9. Trease, G.E and Evans,W.C,1989, *A textbook of Pharmacognosy*, BailliereTindall Ltd, London, 53