



CODEN [USA]: IAJPBB

ISSN : 2349-7750

## INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187

<https://doi.org/10.5281/zenodo.7544275>Available online at: <http://www.iajps.com>

Research Article

### PHYTOCHEMICAL SCREENING AND IN VITRO ANTI- INFLAMMATORY ACTIVITY OF AQUEOUS EXTRACT OF CINNAMOMUM VERUM (BARK)

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**Article Received:** December 2022    **Accepted:** December 2022    **Published:** January 2023

**Abstract:**

*Traditional herbal medicines are naturally occurring, plant-derived substances with minimal or no requirement of industrial processing that has been used to treat illness within local or regional healing practices. The utilization and application of plants for healing purposes predate human history and lead to the origin of much modern medicine. Traditional herbal medicines are naturally occurring, plant-derived substances with minimal or no requirement of industrial processing that has been used to treat illness within local or regional healing practices. The utilization and application of plants for healing purposes predate human history and lead to the origin of much modern medicine. The ethnomedicinal data reveals plant is a potential source for the treatment of bronchitis, cardiac disorder, cephalalgia, cardiac diseases, diarrhea, uropathy, fever, arthritis, coughing, impotence, frigidity, intestinal spasms, vaginitis, neuralgia, rheumatism. This study deals with Phytochemical screening and in vitro anti-inflammatory activity of aqueous extract of Cinnamomum verum bark. The plant material was collected and subjected to extraction by distilled water. Further phytochemical test and anti-inflammatory activity of the extract was evaluated. The results showed that The percentage yield of aqueous extract of Cinnamomum verum was found to be 16.12% with dark brown colour. The phytoconstituents like Alkaloids, Saponins, Phenols, Carbohydrates, Flavonoids, Proteins & amino acids, Diterpenes were found to be present. The percentage inhibition for standard drug diclofenac was found to be 313.70% while for aqueous extract of Cinnamomum verum the IC50 value was found to be 268.29%. The results indicate that the aqueous extract of Cinnamomum verum have more potent anti-inflammatory effect than standard drug diclofenac.*

**Keywords:** Cinnamomum verum, Anti-inflammatory activity, Phytochemicals, Herbal medicines.

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Please cite this article in press Vivekanand Katare et al, *Phytochemical Screening And In Vitro Anti Inflammatory Activity Of Aqueous Extract Of Cinnamomum Verum (Bark)*., Indo Am. J. P. Sci, 2023; 10(01).

**INTRODUCTION:**

Herbal medicine or phytomedicines is related to use different parts of medicinal plants. Herbalism has a deep tradition of its application outside of conventional medicine. In the past decades, it is now becoming mainstream as advancement and developments in analysis and quality control along with advances in clinical research. Natural product coming from natural sources like plants was used by human beings over the years as food and medicines, especially plants parts or whole plant to cure and prevent disease. It is very much difficult to calculate the exact time when people started using plants as medicine, As per the World Health Organization (WHO), phytomedicine or herbal medicine is the sum total of the knowledge, skill, and practices based on the theories and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement, or treatment of physical and mental illness [1,2].

Traditional herbal medicines are naturally occurring, plant-derived substances with minimal or no requirement of industrial processing that has been used to treat illness within local or regional healing practices. The utilization and application of plants for healing purposes predate human history and lead to the origin of much modern medicine. Research and studies based on clinical, pharmacological, and chemical studies of these herbal medicines, which were derived predominantly from plants, were the only basis of most early medicines. The herbal medicines or phytomedicines continue to expand rapidly throughout the world. Many people are now resorting to herbal products for the treatment of various health challenges in different national health-care settings. Last decades witnessed a surge in public interest towards natural therapies both in the developed and developing countries [3,4].

Cinnamomum is one of the oldest known spices used in cookery art. Though numerous species of this genus are marketed as cinnamon but the inner dried bark of *Cinnamomum verum* J. Presl (belonging to family Lauraceae), has been considered as the true cinnamon. Cinnamaldehyde, the major active constituent of cinnamon, is primarily responsible for rendering taste, odour and flavour to the foodstuffs. It also offers protection against oxidative stress, microbial infection and other chronic diseases [5,6].

The ethnomedicinal data reveals plant is a potential source for the treatment of bronchitis, cardiac

disorder, cephalalgia, cardiac diseases, diarrhea, uropathy, fever, arthritis, coughing, impotence, frigidity, intestinal spasms, vaginitis, neuralgia, rheumatism. Cinnamaldehyde is the principal phytoconstituent of the CEO responsible for almost all the pharmacological activities exerted by cinnamon. The common signaling pathway and the cinnamaldehyde' functional group is the basic reason for a broad spectrum of its medicinal attributes. The plant is extensively studied for its anti-diabeti potential followed by antimicrobial, antioxidant, anti-inflammation and anticancer, etc. It has been observed that it is not yet fully explored for its anti-HIV, antiparkinson and other emerging infectious and life style diseases [7,8].

**Experimental:****Materials:****Collection of Plant:**

The barks of selected plant namely *Cinnamomum verum* were identified and collected from Moolchand Phoolchand Herbal store, Bhopal. The collected plant material was pulverized into moderately coarse powder and stored in airtight container for further use.

**Methods:****Extraction of Plant Material:**

Powdered plant drug was weighed (25 gm) and packed in air tight glass container. The plant Material (barks) was extracted with water for about 24 hrs with randomly shaking. Shaking of the drug during maceration is essential in order to replace the saturated layers around the drug with fresh menstruum. The liquid extract was collected in a tarred conical flask. The solvent removed by evaporating the solvent using hot plate. The dry extract obtained was weighed to calculate the percentage yield.

**Preliminary Phytochemical Screening:**

Preliminary phytochemical screening means to investigate the plant material in terms of its active constituents. In order to detect the various constituents present in the aqueous extracts of *Cinnamomum verum* was subjected to the phytochemical tests as per standard methods [9].

**Evaluation of *in vitro* anti-inflammatory activity:**

Anti-inflammatory activity of the *Cinnamomum verum* (aqueous) extract was evaluated by protein denaturation method as described by Padmanabhan and Jangle. Diclofenac sodium, a powerful non steroidal anti-inflammatory drug was used as a standard drug. The reaction mixture consisting of 2 mL of different concentrations of *Cinnamomum*

*verum* extract (100-500 µg/mL) or standard diclofenac sodium (100-500 µg mL<sup>-1</sup>) and 2.8 mL of phosphate buffered saline (pH 6.4) was mixed with 0.2 mL of egg albumin (from fresh hen's egg) and incubated at (37±1)°C for 15 min. Denaturation was induced by keeping the reaction mixture at 70°C in a water bath for 10 min. After cooling, the absorbance was measured at 660 nm by using double distilled water as blank [10].

#### Statistical Analysis:

Results are expressed as a mean ± standard error of the mean. Differences between the means were determined by one-way analysis of variance (one-way ANOVA). A difference in the mean values of *P* < 0.05 was considered to be statistically significant.

#### RESULTS & DISCUSSION:

The percentage yield of aqueous extract of *Cinnamomum verum* was found to be 16.12% with dark brown colour. The phytoconstituents like Alkaloids, Saponins, Phenols, Carbohydrates, Flavonoids, Proteins & amino acids, Diterpenes were found to be present. The percentage inhibition for standard drug diclofenac was found to be 313.70% while for aqueous extract of *Cinnamomum verum* the IC<sub>50</sub> value was found to be 268.29%. The results indicate that the aqueous extract of *Cinnamomum verum* have more potent anti-inflammatory effect than standard drug diclofenac.

**Table 1: Extractive values obtained from aqueous extract of *Cinnamomum verum***

S. No.	Solvent	Time of extraction (Hours)	Color of extract	% Yield
1	Distilled water	24	Dark Brown	16.12 %

**Table 2: Preliminary phytochemical screening of *Cinnamomum verum***

S. No.	Phytoconstituents	Methanolic Extract
1	Alkaloids	Present
2	Saponins	Present
3	Phenols	Present
4	Carbohydrates	Present
5	Flavonoids	Present
6	Proteins & amino acids	Present
7	Diterpenes	Present

**Table 3: Effect of AQC on protein denaturation**

Concentration (µg/mL)	% Inhibition
100	37.35
200	40.12
300	54.47
400	62.22
500	70.54
IC <sub>50</sub>	268.29

**Table 4: Effect of Diclofenac sodium on protein denaturation**

Concentration (µg/mL)	% Inhibition
100	27.24
200	36.14
300	45.56
400	60.11
500	73.38
IC <sub>50</sub>	313.70

**CONCLUSION:**

The major constituents of *Cinnamomum verum* are found to be flavonoids Diterpenes, Alkaloids, phenols, Saponins, carbohydrates, protein and amino acids are well known natural products known to possess several notable biological properties. In the present study, the in vitro anti-inflammatory activity of *Cinnamomum verum* can be attributed to its flavonoids and phenols content. The effect may be due to the synergistic effect rather than single constituent. Therefore, from the results of the present preliminary study it can be concluded that aqueous extract *Cinnamomum verum* possessed marked in vitro anti-inflammatory effect against the denaturation of protein.

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