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Analgesic activity of *Cryptocarya stocksii* plant by hot plate method

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Abstract

The *Cryptocarya stocksii* belongs to the Lauraceae family is an endangered evergreen tree located in Western Ghats of Karnataka, India. Many species of this genus have been used extensively as traditional medicines to cure number of diseases. The present study was conducted to investigate the analgesic activity of petroleum ether, chloroform and ethanol extracts of *C. stocksii* in an animal model at the dose of 500mg/kg body weight. The analgesic activity of *C.S* extracts was evaluated by hot plate method. The chloroform extract showed significant analgesic activity of 71.2% and ethanolic extract showed 35.8% followed by petroleum ether of 33.55%, when compared to the standard aspirin at the dose of 150mg/kg body weight.

Keywords: Hot-plate, analgesic, albino, mice and *Cryptocarya*

1. Introduction

Higher plants are 'treasure houses' for a repertoire of phytochemicals. Medicinal plants form a sizeable component of traditional medicine and are a mainstay for 80% of the people in developing nations. Limited numbers of medicinal plants have received a detailed scientific Scrutiny. In recent years, the investigation of the efficacy of plant-based drugs used in the traditional medicine have been paid great attention because they are cheap, have little side effects ^[1]. The demand for plant based medicines, health products, pharmaceuticals, food supplement, cosmetics etc., are increasing in both developing and developed countries. Drugs which are in use presently for the management of pain and inflammatory conditions are either narcotics e.g. opioids or non-narcotics e.g. salicylates and corticosteroids e.g. hydrocortisone. Most of these drugs exhibit well known side and toxic effects ^[2]. As a result there is need for search of complementary and alternative medicines for analgesic activity. It is therefore essential that efforts should be made to introduce new medicinal plants to develop more effective and cheaper drugs. Plants represent a large natural source of useful compounds that might serve as lead for the development of novel drugs ^[3].

The genus *Cryptocarya* (Lauraceae) comprises a group of about 350 species of mostly evergreen trees, widely distributed in tropical, subtropical and temperate regions of the world. Previous phytochemical investigations on the genus established the presence of numerous different classes of natural products.

C. stocksii is an evergreen endangered plant growing in Western Ghats of Karnataka, India in Chikmagalur district, which belongs to the family Lauraceae. Since there are no systematic studies on this plant, present study was under taken to study the analgesic activity of the plant extracts.

2. Materials and methods

2.1 Plant material

The bark of the *C. Stocksii* was collected from Western Ghats of Karnataka, India. The plant material was identified and authenticated. Voucher specimen number PS175/30.2014, was deposited in department for future reference. The plant material was washed with distilled water and shade dried.

2.2 Preparation of the extracts

The shade dried plant material was powdered weighed and subjected for Soxhlet extraction procedure using Petroleum ether (60-80 °C), chloroform and, ethanol for 48hrs. The solvent was recovered using rotatory vacuum evaporator under reduced pressure and the extract was stored at 4 °C until use

2.3 Animals

Adult wistar albino mice of either sex, weighing 20-25 g were procured from National College of Pharmacy, Shivamogga, Karnataka, India. The animals were housed in polypropylene cages in standard environmental conditions of temperature (21±2 °C), humidity (55±10%) and a 12-hour light-dark cycle. The mice were given a standard laboratory diet (Commercial pelleted food from Hindustan Lever Ltd., Bangalore) and water ad libitum. Food was withdrawn 12h before and during the experimental hours.

All experimental protocols were approved by the institutional animal ethics committee having registration no. 144/1999/CPCSEA/dated: 10/04/2000

2.4 Acute Toxicity studies

Acute Toxicity study was conducted by Stair case method. The LD₅₀ for each of the extract was determined and one tenth of the extract dose (LD₅₀) was selected as maximum dose for the evaluation of Analgesic Activity.

2.5 Analgesic activity of *C. Stocksii* extract by Hot plate method

The analgesic activity of the *C. Stocksii* plant was examined using Hot plate method. Animals were divided into V groups, each group containing six animals each. Group I served as the positive control with no protection. Group II animals received the standard drug of aspirin 150mg/kg body weight, whereas group III to V animals were orally administered the various plant extracts viz., pet ether, chloroform and ethanolic extracts at the dose of 500 mg/kg body weight respectively.

The temperature of the hot plate was maintained 55±1 °C, mice were placed on the hot plate and time in seconds for paw licking or jumping was recorded as basal reaction time. Cut off time in the absence of response was 15sec to prevent the animals being burnt. The reaction time in seconds (latency period) was observed on hot plate, the time taken for mouse to react to the thermal pain by licking its paw or attempting to jump out. Observations were made before and after administration of respective drugs at an interval of 60 min.

2.6 Statistical analysis

The results were expressed as mean ± S. D and were evaluated by one way ANOVA followed by Dunnett's multiple comparisons. The results obtained were compared with the control $p < 0.01$ and standard $p < 0.05$ considered to be statistically significant.

3. Results and discussion

The present investigation reveals that the chloroform extract of *C. Stocksii* exhibit its maximum analgesic activity of 72.7%, by hot plate method at the given dose of 500mg/kg, and it was significant when compared with control and standard group. The ethanolic extract showed a moderate analgesic activity of 35.3% when compared with control and standard group.

But pet ether extract shows 33.5% of activity, seen to be insignificant when compared to the standard group. The graph represented the percentage of analgesic activity of ethanolic chloroform and pet ether extract, standard and control.

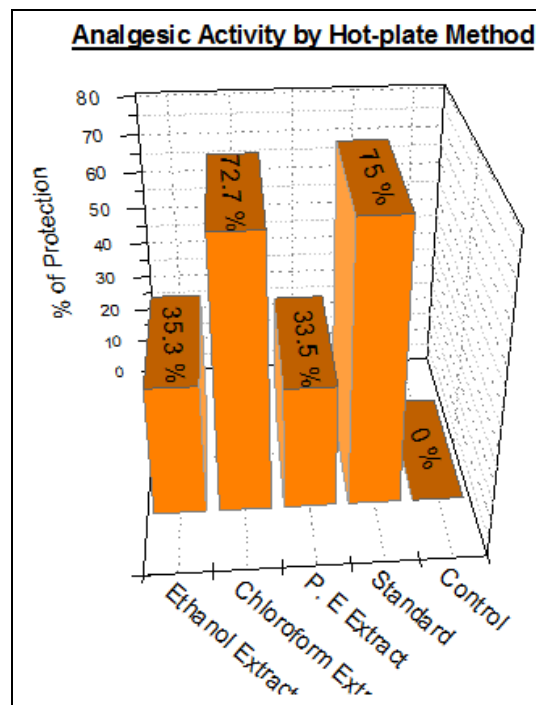


Fig 1: Graphical representation of different extracts of *C. Stocksii* compared with standard and control.

4. Conclusion

Unpleasant sensory and emotional experience associated with acute or potential tissue damage leads to pain. Analgesic effect against thermal noxious stimuli may be elicited through opioid receptors or through modulation of several neurotransmitters involved in relevant phenomena [10]. From the above results we can conclude that the plant *C. stocksii* having analgesic activity and better results are obtained from chloroform extract. The analgesic activity of the *C. Stocksii* extract may be due to the interference of their active principles with the release of pain mediators. Thus further study is needed to identify the chemical constituents present in the extract that may have analgesic activity.

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