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Evaluation of Counter Irritant Potential of Aqueos Bark Extract of *Cinnmon Loureiroi*

Imran Ahmad Khan[1*] Abdul Aziz[2] Shaukat Hussain Munawar[3] Zahid Manzoor[4] Muzammal Sattar[5] Aqsa Afzal[6]

[1,2,6]*Faculty of Pharmacy, Bahauddin Zakariya University, Multan, Pakistan*
[3.4]*Faculty of Medicine and Allied Medical sciences, Isra university, Islamabad, Pakistan*
[5,] *Departmnent of Physiology & Pharmacology, University of Agriculture, Faisal Abad, Pakistan*
imranahmadkhadurrani@gmailcom

Subject: Pharmacology

Abstract

Crude aqueous bark extract of *Cinnamon loureiroi*. was evaluated for counter irritant activity. Irritation was induced by the clockwise frictional movement of fine sand paper to the ear of rabbits of average 1.5 kg body weight. The counter-irritant activity was determined by calculating the mean decrease in redness and erythma with those of control. cinnamon extract (25, 50, 75, 100µg / 10 ml) showed counter irritant when compared with standard drug dexamethasone. All the extracts, showed the counter irritant activity. Highest (91.97% inhibition) and the lowest (41.39 % inhibition) respectively.

Keywords: *Counter irritant, Cinnamon loureiroi , rabbit's skin, dexamethasone .*

Introduction

Skin irritation is known as "the production of reversible damage of the skin following the application of a test substance for up to 4 hours" (OECD, 1981). Pathological characteristics and manifestation of skin irritation such as, Erythema and edema are manifestations of dermal irritation. Irritation is initially manifest by redness (erythema), vesicles, serous exudates, serous scabs (eschar) and various degrees of swelling (edema). Over time, other reactions may be manifest, like small areas of scaling, hyperplasia, hyperkeratosis and alopecia. Histopathology is useful in discerning among responses. In most cases inflammation is well developed within the first 72 hours of observation. (Gallegos et al., 2006)

Cinnamon loureiroi use as medicine is thousand years old mentioned in several books of the Bible and in the histories of ancient Rome and Egypt as well as medieval Europe (Keith Singletary, 2008). Ayurvadic and folklorik uses are, wound healing, flatulance, erectile sysfuction, conjectivitis, leukorrhea, vaginitis, rheumatism, neuralgia, aphrodiasic, anti allergy, antifungal, insecticidal, antipyretic, analgesic, antiulserant, nematocidal (www.naturalstandard.com; Das *et al*., 2013). Its historical uses were, antidiabetic (Qin *et al*., 2003; Kim et al., 2006) anticancer (Schoene *et al*., 2005) antimicrobial (Sing *et al*., 2007) anti inflammatory (Kim *et al*., 2007) blood pressure lowering (Preuss et al., 2007) cholesterol lowering (Khan *et al*., 2003) antidirrheal, cough, sore throat, indigestion, , chest congestion, abdominal pain, headache (waris *et al*., 2003). tooth ache (Archer, 1998) medication resistan yeast infections (www.herbwisdom.com). Smelling of cinnamon enhanceses cognitive function and memory (Palmer *et al*., 1998). prevention of cardiovascular diseases, carcinogenesis, atherosclerosis (Srinivasan, 2005) vomiting (Khan *et al.,*2014)

Material and Method

Material

Chemicals

Dexamethazone sod. Was perchased from Ethical laboratories (Pvt) Ltd. Pakistan and *Cinnamon loureiroi* was purchased from local market of Multan, Pakistan.

Animals

Rabbits of either sex with the average weight of 1.5 kg was purchased from Animal market Hussain Agahi Multan, After 1 hr observing the nomal dermatological and allergic behaviour, the counter

irritant activity was evaluated. All the rabbits were kept under laboratory conditions at room temperature with 12h light and dark cycles. All animal experiments were carried out in accordance with the acts of the Animal Ethical Committee of Baha-uddin zakariya university, Multan, Pakistan.

Method

Collection of Plant Materials

Indigenous medicinal plant *Cinnamon loureiroi*. known by a local name of "Dal chinni". The plant were collected from the local market of Multan, Pakistan. The plant material was authenticated by expert taxonomist, Professor Dr. Altaf Dasti at the Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan, Pakistan.

Crude extract

The plant material was made free from foreign adulterants and vegetative debris by hand picking. Special electrical herbal Grinder was used to form coarse powder. Uniform dark brown powder was obtained with characteristic smell. Powdered *Cinnamon loureiroi* dissolved in disstiled water, fluid obtained was filtered through Whattman-1 Filter paper (Horborn, 1971).

Counter- irritancy assay

Assay for counter irritant effect of aqueous bark extract of *Cinnamon loureiroi.* was performed with some specified modifications in assay described by Syed Saeed ul Hassan et al. (2013). Sand paper with fine particles was used to irritate inner surface of rabbit's ear in clockwise direction for 10 minutes. Irritation, redness and erythema were produced in area of 2.0 cm^2 in diameter. 100µl solution from each concentration of *Cinnamon loureiroi* and dexamethason (Standared) was applied to the irritated area. Distilled water treated ear was used as control. Ears were examined for intensity of erythema. A group of 3 rabbits for each was used while performing main assay by increasing concentration of irritants. Rabbits were examined after every 10 minutes. The numbers of ear showing decreased irritancy, redness and erythema were observed and recorded. The previous authors used control and test extract but not the effect of standared drug comparison. The time, dose and and degree of couter irritancy was missing which is provided in this assay.

Phytochemical Study

The crude plant extracts were initially screened qualitatively with different organic solvents and reagents to detect the presence of some phytochemicals classes (Tona et al., 1998).

Toxicity Study

Cinnamon is used as a spice in food material in Asia so its safety is quite obvious. Budavari et al.(1989) have reported acute toxicity of *Cinnamon* in the animals is very low i.e. Benzaldehyde (LD50 orally, 1300 mg/kg rat), cinnamaldehyde (LD50 orally, 2220 mg/kg rat), linalool (LD50 orally, 2790 mg/kg rat), and salicylaldehyde (LD50 orally, 520 mg/kg rat)

Statistical analysis

Results

Preliminary phytochemical screening detected presence of tannins, phenols, saponins alkaloid, anthraquinones and coumarins as constituents of the crude aqueous bark extract of *Cinnamon loureiroi***.** (Cl.Cr).

Table 1: Pytochemical analysis of *Cinnamon loureiroi* (bark) crude extracts (Cl.Cr).

Sr. no	Test	Observations	Result
1	Alkaloid	Ppt	Positive
2	Saponins	1cm froth	Positive
3	Tannins	Light purple	Positive
4	Anthraquinones	Pink	Positive
5	Coumarins	Yellow fluorescence	Positive
6	Phenols	Light purple	Positive
7	Flavanoid	Light yellow colour	Positive

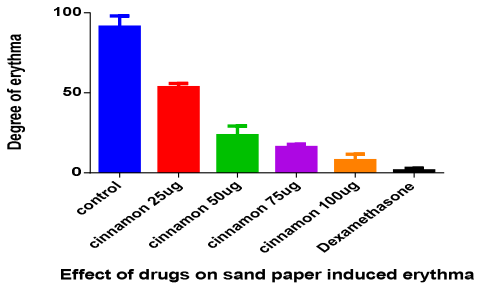

Figure. 1: Counter irritancy effect, Group-I: Control (Distilled water); Group-II: Standard drug (Dexamethasone); Group-III; . Cinnamon loureiroi (50, 100 µl)

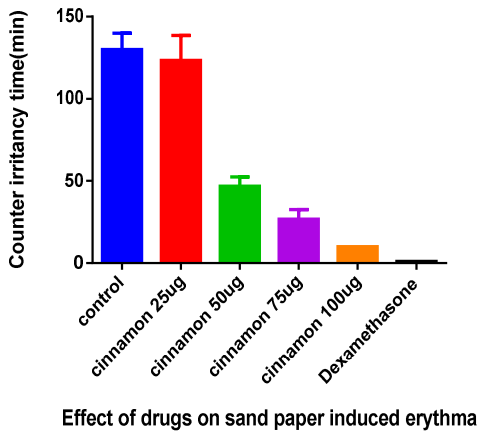

Figure 2: Counter irritancy time, Group-I: Control (Distilled water); Group-II: Standard drug (Dexamethasone); Group-III; Cinnamon loureiroi. .(50, 100 µl)

Table 2: Counter irritant activity of aqueous bark extracts of *Cinnamon loureiroi.* S.E.M.= Standard Error of Mean, **P* <0.1 and ***P*<0.005 vs. control showing significant and most significant values using unpaired Student's *t*-test

Groups	Mean degree of Erythma ± S.E.M	Inhibition (%) of Erythma	Counterge ncy time
Control 10ml/kg	91 ± 1.66		
Cinnamon 100 ug/10 ml	7.3 ± 3.12	91.97% ***	10min
Cinnamon 75 ug/10 ml	15.56 ± 1.21	82.90% ***	30min
Cinnamon 50 ug/10 ml	23 ± 1.89	74.72% **	50min
Cinnamon 25 ug/10 ml	53.33 ± 2.31	41.39% *	120 min
Dexamethason	1± 1.09	98.90% ***	1min

A

B

C

D

E

F (Dexa)

Figure 3 (A-F): Counter irritant activity Cinnamon and Dexamethasone (Standared drug)

Discussion

Positive results are connected to the presence of tannins and saponins in the C*innamon*. On local application, the tannins act as astringents, healing, antiexudative, anti–irritative, anti-inflammatory antiseptic, anesthesic and antioxidant. Tannins form complexes with the proteins from the superficial layers of the skin, leading to the formation of a protective layer of protein-tannins. Moreover, the tannins act as antiseptics through the precipitation of the proteins from the membrane of the microorganisms and anti-inflammatory through the inhibition of the synthesis of prostaglandins and the freeing of the plachetary activating factor (PAF) (Mahesh et al., 2008). Saponins, which from a structural point of view are glycosides, have an antiseptic and antimicrobial action, in a non-harmful way for the neighboring cellular tissues. The specialty literature draws attention to. Flavonoic derivates develop anti-inflammatory effects (mainly by inhibiting the freeing of lisosomal enzymes and reducing the level of oxygen–reactive species) (Casadevall et al., 2001), anti–allergic effects (by inhibiting the classical way the seric complement is activated), anti-microbial, capillary-protective and antioxidant.

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