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EVALUATION OF ANALGESIC, ANTI-INFLAMMATORY OF ROOT OF ETHANOLIC EXTRACTS OF *SWERTIA CHIRATA* LINN

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ABSTRACT

The Present study was intended to evaluate the analgesic and anti-inflammatory activity of Ethanolic extract of *swertia chirata* in experimental standard modals i.e. albino rats following oral administration. The results showed that the ethanolic extract significantly reduce the oedema induced by carrageenan within 1 to 5 hrs. Post dosing at all the dose levels used. On the analgesic property acetic acid induce writhing was significantly reduce in the formalin test; the extract also significantly decreases the painful stimulus in both phases of test which confirms central and peripheral effects of the extract when compare with the standard drug.

KEYWORDS: Analgesic, Anti-inflammatory, *swertia chirata*, albino rats.

INTRODUCTION

Herbs orchestrate resurgence and vegetal awakening is supervened everywhere in the world. Vegetal commodities currently illustrate assurance as compared to the factitious ones that are contemplate as alarming to humans and environment. Out of 2,50,000 higher plant species on this planet, more than 80,000 types are declared to have in some ways remedial importance and around 5000 species have characteristic analeptic value. Organized storage and commodious plowing of relevant medicinal plant species are thus of ample precedence. An important herb Swertia chirayita, is a medicinal plant aboriginal to clement Himalayas in India, Nepal and Bhutan. Its medicinal usage is declared in American and British pharmacopoeias, Indian Pharmaceutical codex and in different conventional systems of medicines like Ayurvedic, Unani and Sidha. Plants mainly utitize in Ayurveda can contribute organically active compounds and lead structures for the advancement of transformed subordinates with increased activeness and abate virulence. We are well enumerate as the most paramount chirayita producer and vendor based in India. The chief bioactives of Swertia are Xanthones, other active constituents of this genus are the secondary metabolites which played a momentous role in biological activities like being hepatoprotective, digestive, astringent, laxative, anti-inflammatory and anti-malarial. Hence this herb provides potent therapeutic lead compounds, which would be beneficial for mankind. *Swertia Chirata* is a belongs family Gentianaceae used in folk medicine for antipyretic, anthelminitic, antiperiodic, cathartic and in asthma and leucorrhoea in Ayurveda and as harsh, analeptic, stomachic, mitigate inflammation, relaxing to pregnant uterus and never ending fever.[1]

MATERIALS AND METHODS

Preparation of extracts[2-3]

Dried and powdered Root material of *Swertia Chirata* (500 g) was successively Soxhlet extracted with petroleum ether (60-80°), chloroform, acetone, ethanol and water for 48 h each. Crude aqueous extract of this plant was prepared separately by boiling the plant material (25 g) with 200 ml of water for 15 min. The obtained extracts were evaporated in vacuum to give residues and their percentage yields were determined.

Animals and treatment[4-5]

Healthy Wistar rats of either sex (150-180 g), with no prior drug treatment, were used for the present studies. The animals were fed with commercial pellet diet and water ad libitum. The animals were acclimatized to laboratory hygienic conditions for 10 days before starting the experiment. Animal study was performed in the Division of Pharmacology.

Acute toxicity studies

The acute toxicity test of the extracts was determined according to the OECD (Organization for Economic Co-operation and development) guidelines No. 420. Female Wistar rats (150-180 g) were used for this study. After the sighting study, starting dose of 2000 mg/kg (p.o.) of the test samples was given to various groups containing five animals in each group. The treated animals were monitored for 14 days, for mortality and general

behaviour. No death was observed till the end of the study. The test samples were found to be safe up to the dose of 2000 mg/kg, and, from the results, 400 mg/kg dose was chosen as the maximum dose for further experimentation.

Analgesic Study[6-15]

Analgesic effects was evaluated using three different models: the writhing test, tail flick test and formalin test.

Writhing Test

Male Swiss rats (180-200 g) were used according to the method described previously by.[10] The total number of writhings, following intraperitoneal (i.p.) administration of 0.6% acetic acid, was recorded for 20 min. starting 10 min. after injection. The animals were pretreated with hydroalcoholic extracts (HAEs) from Root of *Swertia Chirata* 100, 150, 200 mg/kg b.wt respectively.

Analgesic activity[11-13]

Table 1: writhing test

Tail-Fick Test

The basal reaction time of each mouse was determined using tail-withdrawal response when one-third of the tail was immersed in water bath at 51˚C.[11] The cutoff time for immersion was 180 s. The reaction time was evaluated 30, 60, 90, 120 and 240 min after oral administration of extracts, distilled water or acetylsalicylic acid.

Formalin Test

The method used in our study was similar to that described previously.[12] Twenty microliter of 5% formalin was injected subcutaneously into the right hind paw of mice. The time (in seconds) spent in licking and biting responses of the injected paw was taken as an indicator of pain response. Responses were measured for 5 min after formalin injection (early phase) and 20–30 min after formalin injection (late phase). Swertia Chirata root M extracts (0.5 and 1.0 g/kg, i.p.) were administered 60 min before formalin injection. Indomethacin (10 mg/kg, i.p.) was administered 30 min before formalin injection. Control group received the same volume of saline by oral administration.

Anti-inflammatory activity[16]

Carrageenan induced hind paw edema in rats Paw edema was produced in rats by carrageenan following the methods of Winter et al. (1962) respectively.[13] Male rats eighing 100–120 g were divided into groups of six animals. A volume of 0.05 ml of 1% carrageenan in normal saline solution (NSS) in 0.2M carbonate buffer was injected intradermally into the plantar side of the right hind paw of the rat. Test drugs and vehicle were given 1 h prior to carrageenan injection. Paw volumes were measured using a plethysmometer (model 7150, Ugo Basile, Italy) before as well as 1, 3 and 5 h after carrageenan, injection. Results obtained were compared with those obtained from there.

Analgesic activity

Table 1: writhing test.

Group	Traetment	N	Route of administration	Dose mg/kg	No.fo writches	Inhibition writhing response
1	Comtrol	6		-	49.06±4.08	
2	Aspirin	6	300	i.p	12.05±2.14	90
3	Root of Swertia Chirata	6	50	i.p	20.65±2.10	40
4	Root of Swertia Chirata	6	100	i.p	18.85±1.78	65
5	Root of Swertia Chirata	6	150	i.p	8.68±1.14	85

Mean = S.E.M. of 6 animals. ** = P≤0.001= highly significant. Group II, III, IV, and V compared with Group I.

Anti-inflammatory activity

Table 2: Carrageenan –induced paw edema method.

Group	n	Dose (mg/kg)	Pawvolume increase(ml)			Inhibition (%)		
			1hr	3hr	5hr	1hr	3hr	5hr
Control	6		0.36±0.07	0.69±0.05	0.82±0.03			
Aspirin	6	300	0.10±0.02**	0.21±0.02**	0.27±0.03**	72	70	67
Swertia Chirata	6	100	0.22±0.04*	0.47±0.01*	0.51±0.02*	39	32	38
Swertia Chirata	6	150	0.18±0.03*	0.39±0.01*	0.42±0.04*	50	43	49
Swertia Chirata	6	200	0.07±0.01**	0.24±0.02**	0.35±0.02**	81	65	57

n = 6 animals in each group. * = p≤0.01 (significant). ** = p≤0.01(highly significant) control groups, which received vehicle only.

RESULT

Analgesic activity of administration of Swertia Chirata root ethanolic extract at the dose level of 100, 150 and 200 mg./kg b. wt. to the rats produced weak effect on the writhing induced by the injection of 0.6% acetic acid when compared with the aspirin (300mg/kg) by 79% while the treated group with Swertia Chirata root ethanolic extracts inhibited the writhing by 40%, 65%, 85% respectively(table 1). The ethanolic extract of Swertia Chirata root (100- 200 mg/kg) produced

inhibition of formalin induce biphasic pain response (neurogenic and inflammatory pain) in rats. The analgesic effect of this fraction occurred predominately during the II phase; 200 mg dose level was more efficient in the late phase. Anti-inflammatory activity of Swertia Chirata root, The inhibitory activity on carrageenan induced rat hind paw edema, caused by the subplanatar administration of Swertia Chirata root ethanolic extract, at various assessment times after carrageenan injection are shown in table 2. aspirin, a cyclooxygenase inhibitor, at the dose of 300mg/kg body weight exhibited significant ($p \leq 0.01$) edema inhibition.

Swertia Chirata root ethanolic extract at doses of 50,100,150 mg/kg boy weight also possessed significant ($p \leq 0.001$) inhibitory effect on carrageenan induced paw edema at all recorded times. This increase was observed at 1 hr. and was maximum at 5hr. after administration of carrageenan in the vehicle group.

DISCUSSION

The inflammatory effect, analgesic properties of Swertia Chirata root ethanolic extract ethanolic extracts were investigated in the present study The writhing test allows us to identify central and peripheral analgesic compound.[15] The tail formalin test is recent algesiometric assay in which only behaviour suggestive of pain is the licking of tail. From these results is concluded that the extract from Swertia Chirata root ethanolic extract possess both peripheral and central analgesic activity along with marked anti-inflammatory activity in rats and also the present study provoke the traditional use of Swertia Chirata root ethanolic extract for the purpose various ailments like analgesic and anti-inflammatory.

CONCLUSION

The ethanol extract of Swertia Chirata root has moderate and safe oral both peripheral and central analgesic activity along with marked anti- inflammatory activity in rats.

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REFERENCES

1. Rout, P. K., Naik, S. N., & Rao, Y. R. Composition of the concrete, absolute, headspace and essential oil of the flowers of Swertia Chirata Linn. Flavour and Fragrance Journal, 2006; 21(6): 906-911.
2. Ibrahim, R., Salahbiah, A. M., Khoo, C. K., Azhar, M., Ashanul, K. A. W., Rasol, A., & Muse, R. Development of embryogenic culture system for the production of essential oils using bioreactor technology from Michelia alba. P-INCOBB- 18., 2005.
3. Rajagopalan PM. Siddha medicine. Madurai: Siddha Maruthuva Gurukulam., 2000.
4. Nadkarni M. Indian Materia Medica. 1st ed. Mumbai: Popular Book Depot., 1954.
5. Khan MR, Kihara M, Omoloso AD. Antimicrobial activity of Michelia champaca. Fitoterapia., 2002; 73: 744–8.
6. Sobhagini N, Soumit KB, Malaya KM. Ethno-medico-botanical survey of Kalahandi district of Orissa. Indian J Trad Knowledge., 2004; 3: 72–9.
7. Vimala R, Nagarajan S, Alam M, Susan T, Joy S. Antiinflammatory and antipyretic activity of Swertia Chirata Linn., (white variety), Ixora brachiata Roxb. and Rhynchosia cana (Willd.) D.C. flower extract. Indian J Exp Biol. 1997; 35: 1310–4.
8. Ulla J, Vijaya K, Shantini S. Sesquiterpene lactones from Michelia champaca. Phytochemistry., 1995; 39: 839–43.
9. Takahashi M, Fuchino H, Satake M, Agatsuma Y, Sekita S. In vitro screening of leishmanicidal activity in myanmar timber extracts. Biol Pharm Bull., 2004; 27: 921–5.
10. Koster R, Anderson M, De Beer J. Acetic acid for from Dalbergia odorifera. Chem Pharma Bull., analgesic screening. Federal Proceedings., 1959; 18: 1985; 33: 5606-9. 412-417.
11. Jansen PAJ, Niemergeers CJE, Dony JGH. The inhibitory efect of fentanyl and other morphine–like analgesics on the worm induced tail withdraw reflex in rats rzneimittel forschung., 1963; 13: 502-507.
12. Shibata M, Ohkubo T, Takahashi H, Inoki R. Modified formalin test: characteristic biphasic pain response. Pain., 1989; 38: 347-352.
13. Winter CA, Risley EA, Nuss GW. Carrageenin-induced edema in hind paw of the rat as an assay for anti-inflammatory drug. In: Proceedings of the Society for Experimental Biology and Medicine., 1962; 11: 544–547.
14. Yesilada E, Ku¨peli E. Berberis crataegina DC. root exhibits potent antiinflammatory, analgesic and febrifuge effects in mice and rats. Journal of Ethnopharmacology., 2002; 79: 237–248.
15. Le Bars D, Gozariu M, Cadden S. Animal models of nociception. Pharmacological Reviews., 2001; 53: 628–651.
16. Ch.M.M.Prasada Rao *et al*., analgesic activity of aqueous and alcoholic extract shoots of dendrophthoe falcata, international journal of phytochemistry and Pharmacology., 2013; 3(1): 54-56.