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ANTIULCER ACTIVITY OF AQUEOUS EXTRACT OF *WALTHERIA INDICA* LEAF AGAINST PYLORIC LIGATED ULCER MODEL IN RATS

Jacob Verghese P[1] and Srinivasan D[1*]

[1]Professor, Department of Pharmacology, Karpaga Vinayaga Institute of Medical Sciences, Madurantagam, Kancheepuram District, Tamilnadu, India.

ABSTRACT

The aim of the study is to evaluate the antiulcer activity of aqueous extract of *Waltheria indica* against pyloric ligated (Shay) rat ulcer model. *Waltheria indica* belongs to Sterculiaceae traditionally used for various ailments worldwide. Wistar albino rats were divided into four groups of six animals each. Group 1 as control, group 2 as reference control received Omeprazole (10mg/kg) and group 3 & 4 were received 200 and 400 mg/kg of aqueous extract of *Waltheria indica* respectively. All the test drugs were administered once daily for 3 days by oral administration. Gastric ulcer was induced by ligating the pyloric region under anaesthesia. Four after pyloric ligation, the animals were sacrificed and the stomach were excised and observed for ulcer index. Omeprazole, both the doses of aqueous extract of *Waltheria indica* showed significant decrease in ulcer index. From the result it was conclude that, aqueous extract of *Waltheria indica* exhibited antiulcer activity in pyloric ligated (Shay) rat ulcer model.

Keywords: *Waltheria indica*, Antiulcer activity, Omeprazole, Pyloric Ligation.

INTRODUCTION

Waltheria indica L. belonging to the family Sterculiaceae, also known as velvet leaf, marsh-mallow, monkey bush, boater bush, leather coat, buff coat, etc,.[1]. It is found throughout the tropics and warmer subtropics. *Waltheria indica* grows on disturbed areas, roadside weed, old pastures, cotton fields, rock crevices on top of plains, inundated savannas, riverbanks, forests borders or slopes, impoverished soils, on limestone or basalt rock outcrops [2].

It is a short-lived shrub reaching approximately 2 m in height and 2 cm in stem diameter. The roots are brown and flexible and have a single, strong stem emerging from the ground. The leaves are densely to sparsely pubescent, tomentose, or velutinous. The limb has 3 to 5 basal ribs and 4 to 5 pair of lateral ribs and axillary inflorescences are usually dense. The plant begins flowering at about 6 months old and blooms more or less continuously until its death [3].

In traditional medicine, *Waltheria indica* is used for the treatment of minor ailments (e.g., sore throat, cough) and complicated ailments (e.g., inflammation, asthma). Its roots were used in wounds [4], leprosy [5], fever and pain [6], rheumatism [4], night blindness, gum and teeth disease, diarrhoea and dysentery [7]. The raw leaf and its decoction were used in inflammation, malaria [8], conjunctivitis, convulsion, gastric ulcer and asthma [9]. The stem of *Waltheria indica* was used in infertility, as aphrodisiac and impotance [9]. From the literature review, only few of its ethnobotanical claims were scientifically proved, so the current study is planned to evaluate the antiulcer activity of aqueous extract of *Waltheria indica* leaves against pyloric ligature (Shay) rat ulcer model.

Corresponding Author

Srinivasan D
Email id: sehejan@gmail.com

MATERIALS & METHODS

Plant Collection

The leaves of *Waltheria indica* were collected from Kolli hills with the help of tribal's. The plant was identified as *Waltheria indica* and authenticated by Scientist 'F' Botanical survey of India, Southern Regional Centre, Tamilnadu Agriculture University, Coimbatore. The Voucher specimen (BSI/SRC/5/23/14-15/Tech - 504) has been deposited in department for further references.

Preparation of Extract

The collected leaves were washed and shade dried. The dried leaves were pulverized to get coarse powder using mechanical blender. The coarsely powdered plant material was then subjected to exhaustive extraction by a maceration process using water as a solvent at room temperature for 7 days. Few drops of chloroform was added to avoid contamination. The aqueous extract was concentrated to dry. The collected extract was stored in desiccators and used for further pharmacological study.

Animals

Male Wistar albino rats weighing between 150 – 220 gm were used for this study. The animals were obtained from animal house, Karpaga Vinayaga Institute of Medical Sciences, Kancheepuram, Tamilnadu, India. The animals were placed at random and allocated to treatment groups in polypropylene cages with paddy husk as bedding. Animals were housed at a temperature of 24±2^{o}C and relative humidity of 30 – 70 %. A 12:12 light: day cycle was followed. All animals were allowed to free access to water and fed with standard commercial pelleted rat chaw (M/s. Hindustan Lever Ltd, Mumbai). All the experimental procedures and protocols used in this study were reviewed by the Institutional Animal Ethics Committee.

Pyloric Ligation Induced Ulcer [10]

The animals were divided into four groups each consisting of six rats. Group 1 represented Control group of animals received suspension of 0.1% CMC in distilled water. Group 2 received Omeprazole (10 mg/kg). Groups 3 & 4, received aqueous extract of *Waltheria indica* leaf extract at the dose levels of 200 and 400 mg/kg respectively. The drugs were administered for three days, orally by suspending in 0.1% Carboxy methyl cellulose solution.

On day 3 after the last dose, the rats were kept for 18 h fasting and care was taken to avoid coprophagy. The animals were anaesthetized with pentobarbitone sodium (45mg/kg) by intraperitoneal route. The abdomen was opened by a small midline incision below the xiphoid process; pylorus portion of stomach was slightly lifted out and ligated. Precaution was taken to avoid traction to the pylorus or damage to its blood supply. The stomach was placed carefully in the abdomen and the wound was sutured by interrupted sutures. Four hours after pylorus ligation the rats were sacrificed and the stomach was removed. The stomach was then incised along the greater curvature and observed for ulcers. The number of ulcers was counted using a magnifying glass and the diameter of the ulcers was measured using a vernier caliper and expressed as ulcer index [11].

Score 1: maximal diameter of 1 mm.
Score 2: maximal diameter of 1–2 mm.
Score 3: maximal diameter of 2–3 mm.
Score 4: maximal diameter of 3–4 mm.
Score 5: maximal diameter of 4–5 mm.
Score 10: an ulcer over 5mm in diameter.
Score 25: a perforated ulcer.

Statistical analysis

Data's were expressed as mean ± SEM. The data were analyzed by using one way analysis of variance (ANOVA) followed by Dunnet's t test. P values < 0.05 were considered as significant.

RESULT

The antiulcer activity of aqueous leaf extract of *Waltheria indica* was studied against pylorus ligated (Shay) ulcer model in rats (Table I). Omeprazole was used as reference control. Two dose (200 and 400 mg/kg) levels of aqueous leaf extract of *Waltheria indica* were used and the ulcer index was observed to find out the degree of its antiulcer activity. The ulcer index of control animal was 75.42 ± 5.97 and the Omeprazole treated group was 7.97 ± 0.55. The ulcer index of aqueous leaf extract of *Waltheria indica* (200 and 400mg/kg) were 26.24 ± 1.93 and 10.03 ± 0.93 respectively. Both the doses of *Waltheria indica* (200 and 400mg/kg) showed significant (P<0.001) decrease in ulcer index as compared to control group and it showed equipotent effect as that of Omeprazole.

Table 1. Shows the effect of *Waltheria indica* on ulcer index of pylorus ligated (Shay) ulcer model in rats

S.NO	Drug Treatment	Ulcer Index
1	**Group 1** Pylorus Ligated Control 0.1 % CMC	75.42 ± 5.97
2	**Group 2** Pylorus Ligated + Omeprazole (10mg/kg)	7.97 ± 0.55***
3	**Group 3** Pylorus Ligated + *Waltheria Indica* (200mg/kg)	26.24 ± 1.93***
4	**Group 4** Pylorus Ligated + *Waltheria Indica* (400mg/kg)	10.03 ± 0.93***

Values are presented as mean ± SEM (n = 6)
*P<0.05, **P<0.01 and ***P<0.001 Vs Control

CONCLUSION

The aqueous leaf extract of *Waltheria indica* was studied for its antiulcer activity against pyloric ligated ulcer model in rats. Both the doses of *Waltheria indica* exhibited antiulcer activity by decreasing the ulcer index. The antiulcer activity produced by *Waltheria indica* may be due to its antisecretary property as it showed its antiulcer potential in the pyloric ligated ulcer model. Further study is required to isolate the active principle responsible for its ulcer protective property.

REFERENCES

1. Burkill HM. The useful plants of West Tropical Africa. Royal Botanic Gardens, Kew, UK, 2000, 686.
2. Saunders JG. Sterculiaceae of Paraguay. II. *Waltheria. Bonplandia*, 16, 2007, 143–180.
3. Saunders JG. Resurrection of the Mauui endemic *Waltheria pyrolifolia* (Sterculiaceae, Hermannieae. *Darwiniana*, 49, 2011, 76–85.
4. Dimayuga RE, Murillo RF, Pantoja ML. Traditional medicine of Baja California Sur (Mexico) II. *J Ethnopharmacol*, 20, 1987, 209–222.
5. Olajuyigbe OO, Babalola, AE, Afolayan AJ. 2011. Antibacterial and phytochemical screening of crude ethanolic extracts of Waltheria indica Linn. *Afr J Microbiol Res*, 5, 2011, 3760–3764.
6. Mohammed Z, Sho, M, Ilyas N, Musa KY, Yaro AH. Analgesic activity of *Waltheria indica* Linn. *Eur J Sci Res*, 2007, 16, 6–9.
7. Sita G. Traitement traditionnel de quelques maladies en pays Bissa (Republique de Haute-Volta). *Bulletin Agricole du Rwanda*, 11, 1978, 24–34.
8. Jansen O, Angenot L, Tits M, Nicolas JP, De Mol P, Nikiema JB, Frederich M. 2010. In vitro antiplasmodial activity of ethnobotanically selected plants from Burkina Faso. *J Ethnopharmacol*, 130, 2010, 143–150.
9. Zongo F, Ribuot C, Boumendjel A, Guissou I. Botany, traditional uses, phytochemistry and pharmacology of *Waltheria indica* L. (syn. *Waltheria americana*): A Review, *J Ethnopharmacol*, 148, 2013, 14–26
10. Shay M, Kamarov SA, Fels D, Meraaze D, Grueinstein H, Siplet H. A simple method for the uniform production of gastric ulceration in the rat. *Gastroenterol*, 5, 1945, 43–61.
11. Suzuki Y, Hayashi M, Ito M, Yamagami I. Antiulcer effects of 40-(2-carboxyethyl) phenyl trans-4-aminomethyl cyclohexane carboxylate hydrochloride (Cetraxate) on various experimental gastric ulcers in rats. *Jpn J Pharmacol*, 26, 1976, 471–480.