



ANTI-EMETIC ACTIVITY OF *CLEOME BRACHYCARPA* VAHL., AND *CLEOME VISCOSA* L., (LEAVES) IN CHICKS

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ABSTRACT

Cleome brachycarpa Vahl., and *Cleome viscosa* L., were evaluated for anti-emetic activity in copper sulfate induced chick emesis model. Emesis was induced by copper sulfate (50 mg / kg) and the methanolic extracts of leaves were tested at the dose of 150 mg / kg orally. Chlorpromazine (150mg/kg orally) was used as standard anti-emetic drug. The anti-emetic activity was determined by calculating the mean decrease in number of retching as compare with control. *Cleome brachycarpa* and *Cleome viscosa* showed comparable anti-emetic activity with chlorpromazine.

Keywords: Anti-emetic activity, chicks, *Cleome brachycarpa*, *Cleome viscosa*.

INTRODUCTION

Cleome brachycarpa Vahl., and *Cleome viscosa* L., (family : Capparaceae) are found as a common weed all over the plains of Arabia, Egypt, India, Pakistan and throughout the tropics of the world¹. *Cleome brachycarpa* Vahl., is used for the treatment of rheumatism, scabies² as an appetizer and carminative³. Leaves of *Cleome brachycarpa* are used as vermicides⁴ and powder is given in pain and inflammation⁵. Trinortriterpenoid dilactone, deacetoxybrachycarpone, cabralealactone, ursolic acid are reported from plant⁶. The leaves, seeds and roots of *Cleome viscosa* L., are widely used in traditional and folkloric systems of medicine as an anthelmintic, antiscorbutic, antiseptic, cardiac stimulant, carminative, febrifuge and sudorific⁷, anticonvulsant⁸, antidiarrheal⁹, and also for treating skin diseases¹⁰. Alkaloids, flavonoids, saponins, tannins and steroids are reported from *Cleome viscosa*¹¹. Pharmacological studies have shown that *Cleome viscosa* possesses analgesic, anti-diarrheal, anti-inflammatory, antimicrobial, antipyretic, anthelmintic, hepatoprotective and immunomodulatory activities⁷.

Copper sulfate induced chick emesis model is simple and frequently used for the evaluation of natural anti-emetics¹². *Cleome* species has been used traditionally in different abdominal complaints³. The leaves of *Cleome scaposa* DC.,¹³ and seeds of *Cleome viscosa* L.,¹⁴ have already justified their anti-emetic effects by using chick emesis model. Present study declares the anti-emetic effects of *Cleome brachycarpa* Vahl., and *Cleome viscosa* L., leaves extracts for the first time.

MATERIALS AND METHODS

Animals

Young male chicks, 4 days old (32-52 g) were obtained from Big-bird Poultry Breeders (Pvt) Ltd., Karachi, Pakistan. They were housed in plastic cages with saw dust as beddings under temperature $25 \pm 2^\circ\text{C}$; 12 h/12 h light-dark cycle and given food and water *ad libitum*. Chicks were randomly divided into four groups of six animals each. The groups of animals were transferred in different cages with their identification mark. Permission and approval for animal studies were obtained from Board of Advanced Studies and Research, University of Karachi [BASR. Res. No.25 (15)-2007].

Plant material and extraction

Leaves of *Cleome brachycarpa* Vahl., and *Cleome viscosa* L., were collected by Mr. Arshad Gohar from University of Karachi in July 2012 and sample specimen were deposited in the Department of Pharmacognosy, Faculty of Pharmacy, University of Karachi for future reference. *Cleome brachycarpa* Vahl., and *Cleome viscosa* L., were dried in shade separately at room temperature for 7 days then soaked in methanol for 5

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days and filtered. Methanolic extracts were obtained by using rotary evaporator under reduce pressure at 40°C.

Chemicals used

Copper sulfate was purchased from Scharlau Chemie S.A. Barcelona, Spain. Chlorpromazine was purchased from ICN, USA. DMSO, tween 80 and methanol were purchased from Merck, Darmstadt, Germany.

Anti-emetic activity

The anti emetic activity was evaluated by using chick emesis model¹². Each chick was placed in a large beaker and left to settle for 10 minutes. The methanolic extract of *Cleome brachycarpa* Vahl., and *Cleome viscosa* L., leaves were prepared as a dose of 150 mg/kg body weight in a volume of 10 ml/kg in 0.9% saline containing 5% DMSO and 1% tween 80. The doses were administered abdominally. The control group received only saline 0.9%. After 10 minutes, copper sulfate was administered orally at 50 mg/kg b.w., and the number of retches was observed during the next 10 minutes. Chlorpromazine was used as a standard anti-emetic drug (150 mg/kg body weight).

The percent inhibition was calculated by the following formula:

$$\text{Inhibition (\%)} = (A-B/A) \times 100$$

Where, A = Frequency of retching in control group ; B = Frequency of retching in test group

STATISTICAL ANALYSIS

Anti-emetic activity was expressed as mean \pm standard error of mean. The statistical significance of the difference was determined by an unpaired Student's *t*-test. **P* <0.1 and ***P*<0.005 vs. control showing significant and most significant values.

RESULT AND DISCUSSION

Cleome brachycarpa Vahl., and *Cleome viscosa* L., leaves extract in a dose of 150 mg/kg body weight., reduced the numbers of retches by 57.57% and 43.06%. *Cleome brachycarpa* significantly (***P*<0.005) reduced the number of retches (Table). The group of chicks treated with chlorpromazine had 45 retches compared to the 71 retches of the control group, thus chlorpromazine reduced the retches by 36.99%. From the results it is clear that *Cleome brachycarpa* Vahl., and *Cleome viscosa* L., leaves extracts have anti-emetic potential and is comparable with standard chlorpromazine (Fig.1a&b). Although the result is significant but the mode of action is not known. Anti-emetic activity by using copper sulfate proposed 5-HT₃¹⁵, 5-HT₄¹⁶ or NK₁¹⁷ receptors antagonism. Therefore it may be said that the extracts were able to effectively prevent its effect and have a peripheral anti-emetic action (Fig.2).

As mentioned earlier that triterpenoids such as brachycarpone, deacetoxybrachycarpone, cabralealactone and ursolic acid are reported from *Cleome brachycarpa*⁶ whereas flavonoids are reported from *Cleome viscosa*¹¹. Flavonoids and triterpenoids possess anti-emetic properties¹⁸. So, if flavonoids and triterpenoids are present in the studied extracts it may be implied that the observed anti-emetic effects may be due to the presence of flavonoids and triterpenoids.

CONCLUSION

The present study is on preliminary level and further investigation is required to confirm the anti-emetic effect of *Cleome brachycarpa* Vahl., and *Cleome viscosa* L., leaves and also determine the compounds responsible for this activity with their possible mode of action.

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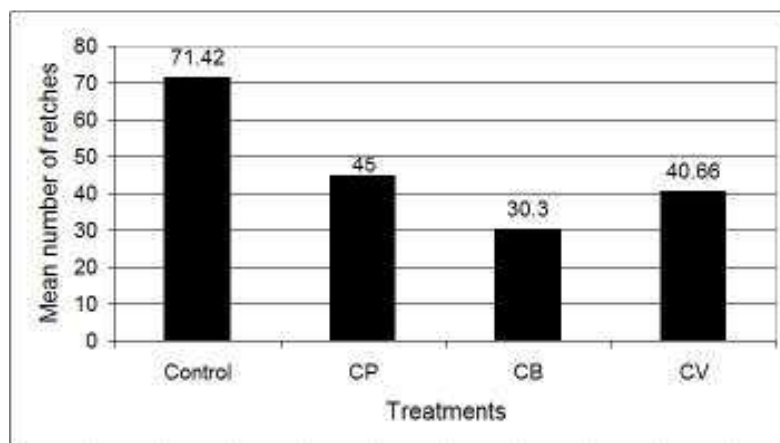
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Table: Anti-emetic activity of *Cleome brachycarpa* and *Cleome viscosa* leaves extract.

Groups	Mean number of Retches \pm S.E.M	Inhibition (%) of emesis
Control	71.42 \pm 3.88	-----
Std. (CP) 150 mg/kg p.o.	45.0 \pm 0.28*	36.99
CB 150 mg/kg p.o.	30.3 \pm 2.04**	57.57
CV 150 mg/kg p.o.	40.66 \pm 1.38	43.06

CP= Chlorpromazine, CB= *Cleome brachycarpa* ., CV *Cleome viscosa*, N = 6 for each group, p.o.= per oral, 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.

a



b

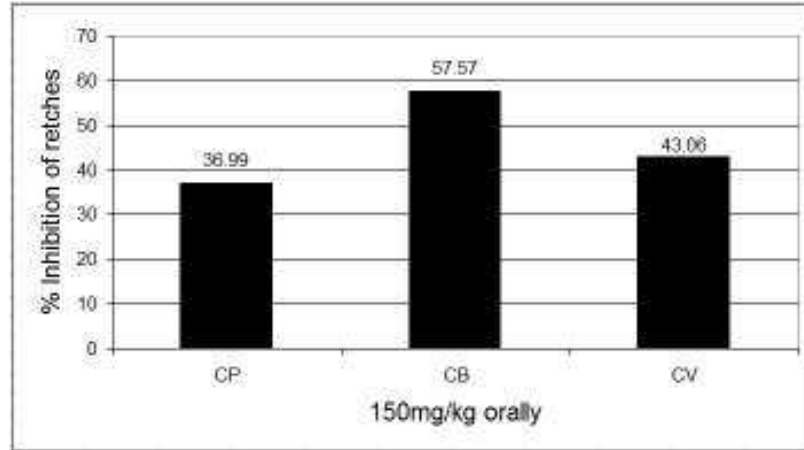


Fig.1(a,b): Comparison of anti-emetic activity of *Cleome brachycarpa* and *Cleome viscosa* leaves extract against Chlorpromazine as an anti-emetic effect in chicks (a) Graphical presentation of Mean number of retches versus dose 150 mg/kg (b) Graphical presentation of % inhibition of retches versus dose 150mg/kg (CP= Chlorpromazine, CB= *Cleome brachycarpa*, CV= *Cleome viscosa*).

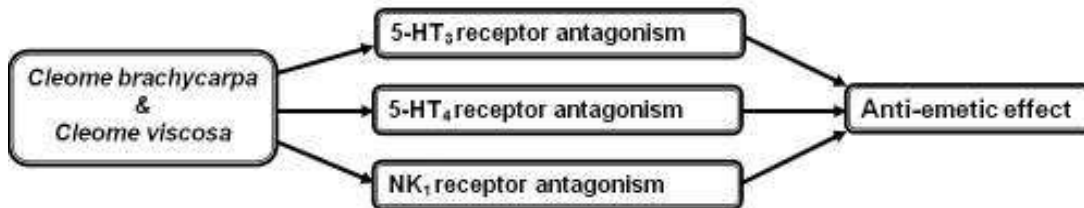


Fig.2: Proposed anti-emetic mechanisms for *Cleome brachycarpa* and *Cleome viscosa*.

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