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Research article

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### Phytochemical screening and antiemetic activity of *Lepidagathis cristata* root extract.

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#### ABSTRACT

*Lepidagathis cristata* root (Family: Acanthaceae) is an herb distributed in central and eastern peninsular India and used as bitter tonic in fevers and used in pneumonia, flu, mouth and lip infections. An earlier study was carried out on this plant has shown antifungal activity, immunosuppressant activity. Chemotherapy induced nausea and vomiting is a common side effect of many cancer treatments. The development of effective antiemetic prophylaxis is one of the most significant steps forward in the area of supportive care. The potential of this extract as antiemetic activity may be due to the presence of phyto constituents like alkaloids and terpenoids and might be responsible for its activity. However, so far the antiemetic property of ethanol extract of *Lepidagathis cristata* root had not been carried out. Hence, in the present investigation extract of *Lepidagathis cristata* root was screened for antiemetic activity by using standard procedures. The results illustrated that the extracts of root have antiemetic potential comparable with that of Metoclopramide.

**Keywords:** Chemotherapy, Antiemetic prophylaxis, Metoclopramide.

#### INTRODUCTION

Chemotherapy induced nausea and vomiting (CINV) is a common side effect of many cancer treatments. The development of effective antiemetic prophylaxis is one of the most significant steps forward in the area of supportive care. The potential of this extract as antiemetic activity may be due to the presence of phytoconstituents like alkaloids and terpenoids and might be responsible for its activity. *Lepidagathis cristata* root (family: Acanthaceae) is an herb distributed in central and eastern peninsular India and

used as bitter tonic in fevers and used in pneumonia, flu, mouth and lip infections. An earlier study was carried out on this plant has shown antifungal activity, immunosuppressant activity and anti-inflammatory activity<sup>1</sup>. Several plants belonging to the genus *Lepidagathis* including *Lepidagathis incurva* known to exhibit strong antioxidant property.

#### MATERIALS AND METHODS

##### Plant material



### Anti-Emetic Activity

Result of the antiemetic activity of ethanol extract of *Lepidagathis cristata* root was given table 2. After administration of a dose of 50mg/kg BW metoclopramide and the extract of seeds (50 mg/kg, 100 mg/kg, 200 mg/kg BW respectively), the number of retches were reduced. The group of chicks treated with metoclopramide was found to have  $15.8 \pm 1.428$  retches as compared to the  $68.6 \pm 2.482$  retches of

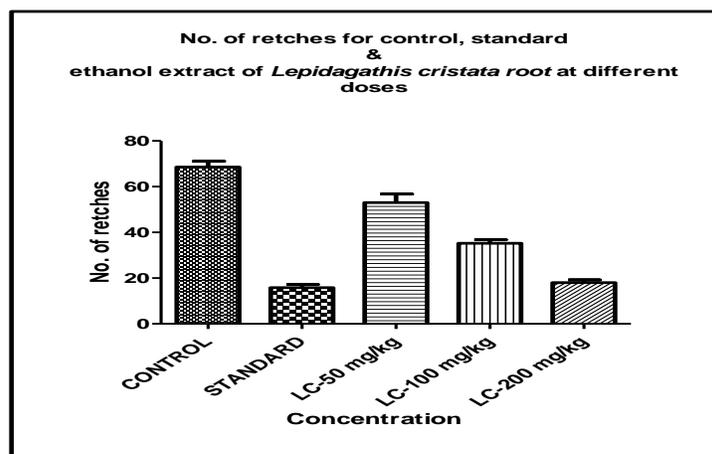
control group, thus metoclopramide reduced the retches by 76.968%. The chicks treated with root extract 50 mg/kg inhibited the retches up to 22.741%, 100 mg/kg inhibited the retches up to 48.688%, 200 mg/kg inhibited the retches up to 73.761%. Therefore, ethanol extract of 200 mg/kg inhibited emesis to an extent equal to metoclopramide at 50mg/kg.

**Table. 2 Antiemetic activity of ethanol extract of *Lepidagathis cristata* root**

S. No.	Drug / Dose	Number of retches (Mean $\pm$ S. E. M)	% Inhibition
1	Control (10ml/kg)	$68.6 \pm 2.482$	-
2	Metoclopramide	$15.8 \pm 1.428$	76.968
3	Extract (50 mg/kg)	$53 \pm 3.755$	22.741
4	Extract (100 mg/kg)	$35.2 \pm 1.594$	48.688
5	Extract (200 mg/kg)	$18 \pm 1.225$	73.761

S.E.M= Standard Error Mean.

The results illustrated that the extracts of root have antiemetic potential comparable with that of metoclopramide (Fig 1.).



**Fig 1. Number retches for control, standard and ethanol extract of *Lepidagathis cristata* root at different doses.**

Retching may occur after administration of cancer chemotherapeutic agents. Chemotherapy induced nausea and vomiting (CINV) is a common side effect of many cancer treatments. Chemotherapeutic agents or their metabolites can directly activate the medullary chemo receptor trigger zone or vomiting center or act peripherally by causing cell damage in the gastrointestinal tract and releasing serotonin from

entero chromaffin cells of the small intestinal mucosa. The released serotonin activates 5-HT receptors on vagal and splanchnic afferent fibers, which then carry sensory signals to the medulla, leading to the emetic response<sup>4, 5, 6</sup>, it has also been established that the peripheral 5-HT receptors play an important role in copper sulphate induced emesis.

Although the results are significant but the mode of action is not known. *Lepidagathis cristata* root reduces copper sulphate induced retchings in young chicks, possibly by peripheral action as the oral copper sulphate induces emesis by peripheral action through excitation of visceral afferent nerve fibers of the gastro intestinal tract<sup>4,7</sup>. This study also justifies the traditional use of *Lepidagathis cristata* in GIT complaints. From chemical point of view, root of *Lepidagathis cristata* contain alkaloids and terpenes showed significant activity as compared to standard. Therefore it may be said that alkaloidal contents may play some role in antiemetic effect<sup>8</sup>. Further studies are required to determine the exact mode of action and the active compounds responsible for these effects.

## CONCLUSION

The development of effective antiemetic prophylaxis is one of the most significant steps forward in the area of supportive care. This development has not only led to improve efficacy but also to a decrease

risk associated with the use of Antiemetics. The results of this study suggest that the ethanol extracts of *Lepidagathis cristata* (200 mg/kg) have protective effect against copper sulfate induced retching in young chickens, possibly by peripheral and central mechanisms. The potential of this extract as antiemetic activity may be due to the presence of phytoconstituents like alkaloids and terpenes and might be responsible for its activity. Further studies (including the analysis and identification of the specific active compounds, toxicological and hematological studies) with this plant extract should be carried out using higher animal models, in order to authenticate it as a potent antiemetic agent.

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