

## Preliminary phytochemical analysis and comparative study of *Allamanda blanchetti* and *Allamanda cathartica* by chick emesis model

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### ABSTRACT

The Present study was carried out to evaluate the phytochemical properties and anti emetic activity of different extracts of *Allamanda cathartica* and *Allamanda blanchetti*. These are perennial shrubs used in traditional medicine for treating jaundice, malaria, The flowers acts as laxative and posses antibiotic action. In the present study the water, chloroform, methanolic and petether extracts of *Allamanda cathartica* and *Allamanda blanchetti* were evaluated for chick emesis model. Emesis was induced by the oral administration of copper sulphate. 50mg/kg body weight chicks were used. The anti emetic activity was determined by calculating the mean decrease in number of retching in contract with that of the control. Phytochemical screening reveals the presence of alkaloids, saponins, tannins carbohydrates and proteins.

**Keywords:** Antimicrobial activity, *Allamanda blanchetti* and *Allamanda cathartica*.

### 1. INTRODUCTION

In developing countries it is estimated that about 80% of the population rely depends upon traditional medicine for their primary health care. There arises a need to screen medicinal plants for bioactive compounds as a basis for further pharmacological studies [1]. Plants are rich sources of Secondary metabolites with interesting biological activities. In general these secondary metabolites are the important source with variety of structural arrangements and properties. [2] Increasing Recognition of herbal medicines as an alternative form of health care it seen necessary to the medicinal plants for active compounds. [3] In the present study *A.cathartica* and *A.blanchetti* were estimated for anti emetic activity as traditionally both these plants are used for gastro intestinal tract disorders. *A.cathartica* a widely growing perennial ornamental shrub belonging to the family apocynaceae. It is commonly known as yellow bulb or golden trumpet or buttercup flowers [4]. It can grow up to an height of 15 feet tall or more is native to Brazil but widely cultivated throughout the world. The plant is used to relieve and made in to decoctions for use in gastro intestinal disorders. This was also widely used as purgative and treatment of jaundice. This plant has anti bacterial and anti cancerous properties. The root and stem of this plant contain two rare lactones which are active against polio virus and

pathogenic fungi. Root is also used in various formulations to treat malarial symptoms. The leaves stem and branches of the plants are used against snake bite (Gomes et al, 2010). [5] Barks are used as hydrogogue in ascites and leaves as cathartic (Kritikar and Basu, 1984) [6]. All parts contain the iridoid and allamandin [7]. There has been no report starting the use of *A.cathartica* for medicinal purposes for India [4].

*A.blanchetti* (*A.violacea* purple allamanda) is an ornamenta plant of an allamanda genus in apocynaceae family. All the parts of the plant poisonous if ingested. *A.blanchetti* is commonly used for gastrointestinal disorders. The compounds plumericin, isoplumericin and 5, 6 dimethoxy coumarin were previously isolated from *A.blanchetti* [8-9]. Many active phytochemicals have been isolated from roots as well.

Emesis also known as nausea and vomiting are commonly associated with indigestion of toxicants, drug side effects, cancer chemotherapy, and first trimester of pregnancy, radio surgery and prostatic procedure.[10-12]

Emesis is mediated through the coordinated actions of central and peripheral receptors like serotonin(5 HT1A,5HT3 and 5HT4).Dopamine type 2(D2)histamine(H1), muscarinic cholinergic(ACH-M), Cannabinoids

(CB1) and Opioids (M2), Neurokinin (NK1) and gamma amino butyric acid (GABAB1)<sup>[13]</sup>.

Many commercially available allopathic drug show their antiemetic action by using these receptors but they also cause undesirable side effects such as dry mouth, hallucination, excessive sedation, dysphoria, hypotension and extra pyramidal signs <sup>[14]</sup>. Antiemetic compounds of plant origin (flavonoids, saponins, terpenes, lignins, hydroxycinnamic acids, cannabinoid, chalcones, polysaccharides, phenyl propanoids, diaryl peptanoids and glycoside derivative have enormous therapeutic potential and also many of the side effects associated with synthetic antiemetic drugs <sup>[15,16]</sup>. So in the present study keeping in view of phytochemical constituents. We have been evaluated antiemetic activity of *A.cathartica* and *A.blanchetti* by chick emesis model.

**2. MATERIALS AND METHODS**

**2.1. Collection and extraction of plant material:**

Plant materials were collected from the surrounding of in and around Rajahmundry, East Godavari district, Andhra Pradesh, India in the month of august and it was authenticated.

**2.2. Preparation of plant extract**

Leaves and flowers of *A.Cathartica* and *A.Blanchetti* were taken and grinded to coarse powder material. Then subjected for soxhlet extract by using solvent ether, chloroform, methanol and water in increasing polarity.

**2.3. Animals and housing condition**

Young chicks (Male/Female) 150-170g, 12-15 days old were taken from local market are kept at room temperature with 15 hrs dark and light cycle. After 24 hrs fasting they were evaluated for antiemetic activity.

**2.4. Drugs and chemicals**

Copper sulphate, Chlorpromazine, Dimethyl sulfoxide, Methanol, Tween 80 were used in experiment.

**2.5. Anti emetic activity**

The antiemetic activity was determined by following the protocols of Akita *et al.*, 1998. The methodology of chick emesis model is depicted in Figure.1. Each chick was set aside in a large beaker for 10 minutes to stabilize. Chlorpromazine and the extract were dissolved in 0.9 % saline containing 5 % DMSO and 1 % tween 80 administered abdominally at a dose of 150mg/kg bodyweight to the test animal. After 10 minutes copper sulfate was administered orally at 50 mg/kg body weight to each chick, then the number of retches was observed during the next

10 minutes. The percent inhibition was calculated by the following formula:

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

Where

A = Frequency of retching in control groups.

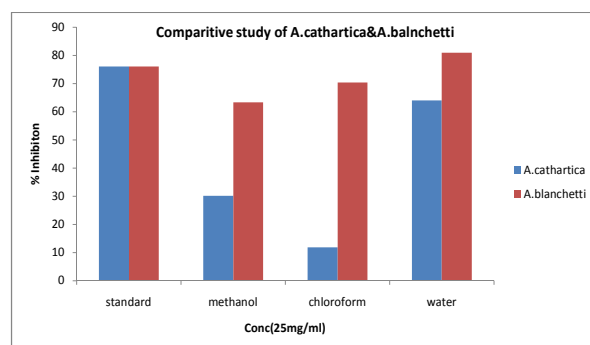
B = Frequency of retching in test groups.

**Table - 1: *Allamanda cathartica***

Treatment	No.of retches	% Inhibition
Control	71±1.17	-----
Standard	17±0.17	76
<i>Cathartica</i> methanol Extract	49.5±0.87	30.2
<i>Cathartica</i> chloroform Extract	62.5±1.02	11.9
<i>Cathartica</i> aqueous Extract	25.5±1.87	64.0

**Table - 2: *Allamanda blanchetti***

Treatment	No.of retches	% inhibition
Control	71±1.17	-----
Standard	17±0.17	76.0
<i>Blanchetti</i> methanol Extract	27±1.45	63.3
<i>Blanchetti</i> chloroform Extract	21±1.87	70.4
<i>Blanchetti</i> aqueous Extract	13±0.17	81



**Figure - 1: Comparative study**

**3. RESULTS AND DISCUSSION**

The results of antiemetic effect of *Allamanda cathartica* leaves are shown in table. The methanol extract of *Allamanda cathartica* showed (30.2%), chloroform extract of *Allamanda cathartica*(11.09%), aqueous extract of *Allamanda cathartica*( 64.0% )and standard drug chlorpromazine (76% )inhibition of retches. The observed number of retches was control (71),

chlorpromazine (17%) and *Allamanda cathartica* methanol extract (49.5%), no of retches of *Allamanda cathartica* chloroform extract (62.05%),no of *Allamanda cathartica* aqueous extract (25.5%) (Figure 1).

The leaves of *Allamanda blanchetti* are shown in table. The methanol extract of *Allamanda blanchetti* showed (63.3%), The chloroform extract of *Allamanda blanchetti* (70.04%),The aqueous extract of *Allamanda blanchetti* (81%) and standard drug chlorpromazine (76%) inhibition of retches. The observed no. of retches was control (71%), chlorpromazine (17%), *Allamanda blanchetti* chloroform extract(21%), methanol extract of *Allamanda blanchetti* (24%),and aqueous extract of *Allamanda blanchetti* (13%) (Figure 1).

These two plants leaves extract were popularly used for the treatment of emesis disorders and the present investigation (antiemetic study) further justify one of them. The mechanism of antiemetic effect of the extract is not clear. In oral copper sulfate induces emesis peripheral 5-HT<sub>3</sub>, 5-HT<sub>4</sub> or NK1 receptors are involved. The aqueous extract of *Allamanda blanchetti* leaves showed significant ( $p < 0.17$ ) antiemetic effect in young chicks.

It could be implied that the leaves of *Allamanda blanchetti* contain alkaloids, cardiac glycosides and flavonoids which are reported as active principles against emesis in chick emesis model. Therefore if these compounds are present in the tested extract, it may be said that they may be involved in the antiemetic activity. Further studies are required regarding the active compounds and the mechanism of action responsible for antiemetic activity of the extract.

The present study of clearly demonstrated that compared to both *Allamanda cathartica* and *Allamanda blanchetti* the aqueous extract of *Allamanda blanchetti* having a definite anti emetic action than significant control.

#### 4. CONCLUSION

Based on comparative study of different leaves extracts of *Allamanda cathartica* and *Allamanda blanchetti* it has been shown that *Allamanda blanchetti* aqueous extract showed significant protective effects against copper sulphate induced retches in chick. Remaining extracts Methanol and chloroform exhibit anti emetic activity in dose dependent manner. The present study validates the folk uses of *Allamanda cathartica* and *Allamanda blanchetti* against G.I. disorders. However, investigation of compounds related to this activity is further required.

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