

ESTIMATION OF ANNONA SQUAMOSA FOR ANTI-DEPRESSANT ACTIVITY

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ABSTRACT

The anti-depressant activity of Ethanolic root extract of *Annona Squamosa* (EREAS) belongs to the family Annonaceae by oral administration at dose according to the body weight in a sequential manner in healthy albino rats was done by using Imipramine as standard drug. Forced swim test (FST) and Tail suspension tests (TST) was done on plant extract given in three doses (100, 200 and 300mg/kg) by dose dependent manner. 300mg/kg plant extract showed decreased immobility time near as to that of the standard drug. The decrease in immobility period in both the models was observed starting from 200 mg/kg. But the increase in dose from 200 to 300 mg/kg produces further reduction in immobility period.

KEYWORDS: Annonaceae, Anti-depressant, *Annona Squamosa*, Imipramine.

INTRODUCTION

Annona Squamosa^[1-2] was a species of the plant genus *Annona*, belongs to the family Annonaceae. The phytochemical analysis of *Annona Squamosa* showed that it contained carbohydrates, alkaloids, Flavonoids.^[3-4] The anti depressant activities of the roots of *Annona Squamosa* by studying the effects of ethanol extracts of the plant on forced swim test and tail suspension test induced depression in experimental animal models, in order to confirm the medicinal properties of the plant.^[5-6] Antidepressant was commonly used in the treatment of anxiety and depression, medical conditions that affect 17–20% of the population.

GEOGRAPHICAL DISTRIBUTION

Annona Squamosa was native to the tropical Americas and West Indies, but the exact origin was unknown. It was now the most widely cultivated of all the species of *Annona*, being grown for its fruit throughout the tropics and warmer subtropics, such as Indonesia, Thailand, and Taiwan; to southern Asia before 1590 as shown in Fig.1.



Fig. 1: *Annona Squamosa* Plant.

MATERIALS AND METHOD

The fresh plant of *Annona Squamosa* roots were collected from Nandivelugu, Guntur, Andhra Pradesh, India. The plant roots were dried under sunlight for one month and chopped into small pieces and dried under sun light. 50 gm of powder sample was extracted with ethanol by using maceration method. The extraction was continued till a few drops of the last portion of the extract left no residue on drying. The solvent was removed by heat evaporation and dried under reduced pressure. The yield of the ethanol extract was 9.4%. The dried extract was stored in refrigerator until further studies.

PHYTOCHEMICAL ANALYSIS

It was carried out by using Ethanolic powdered form of the plant following Harborne (1973) Trease and Evans (1989). Adult Wistar Albino male rats (150-180g) were

kept under standard environmental conditions of room temperature ($220 \pm 20^\circ\text{C}$), relative humidity ($50\% \pm 5\%$) and 12h light and dark cycle. The animals were housed in the colony cages (three rats per cage) and provided feed (commercial pellets contain a balanced ration obtained from the Vyas Enterprises, Hyderabad) and

water ad libitum. All the animals were acclimatized to the laboratory environment 5 days prior to experiment. The animal were fasted overnight just prior to the experiment but allowed free access to drinking water as shown in **Tab.1**.

Tab. 1: Grouping of animals based on dose.

Group	Group	Dosage
I	Control - treated with PEG	According to the body wt.
II	Standard drug: Imipramine	15 mg/kg
III	Low dose of Annona Squamosa	100 mg/kg, p.o.
IV	Mid dose of Annona Squamosa	200mg/kg, p.o.
V	High dose of Annona Squamosa	300mg/kg, p.o

ANTI-DEPRESSANT ACTIVITY

FORCED SWIM TEST (FST)

FST or behavior despair was proposed as a model to test for antidepressant activity by Porsolt et al. Depression was produced by forcing the animal to swim individually in a glass jar containing fresh water of 15cm height and maintained at 25°C . This constituted pretest session.

Twenty-four hour later each animal was again forced to swim. After an initial 2 min period of vigorous activity, each animal assumed a typical immobile posture. The total duration of immobility was recorded in next 4 min of a total 6 min test. The change in the immobility period was calculated after administering drugs as shown in **Tab.2** and **Fig.2**.

Tab. 2: Effect of ASRE on Immobility Period (Secs) of rats using Forced Swim Test.

GROUP	DRUG	DOSE	IMMOBILITY TIME
I	PEG	1ml/100gm	120.60 ± 3.88
II	Imipramine	15mg/kg	$28.00 \pm 1.58^{***}$
III	Annona Squamosa	100mg/kg	$60.60 \pm 2.65^*$
IV	Annona Squamosa	200mg/kg	$45.60 \pm 2.73^*$
V	Annona Squamosa	300mg/kg	$31.40 \pm 2.42^{**}$

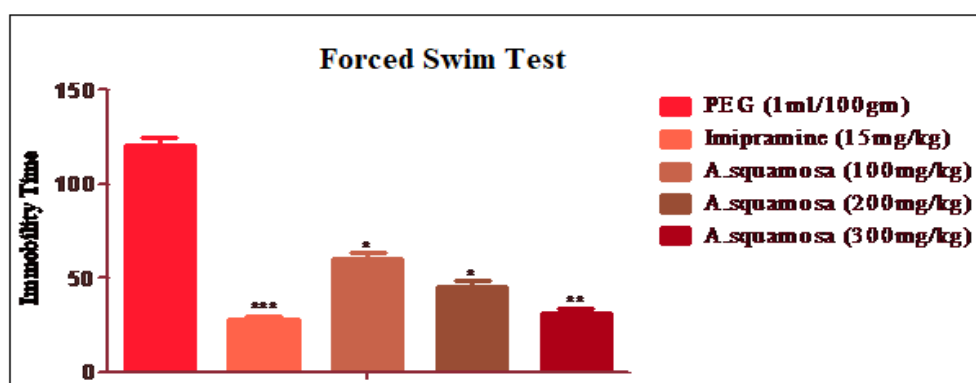


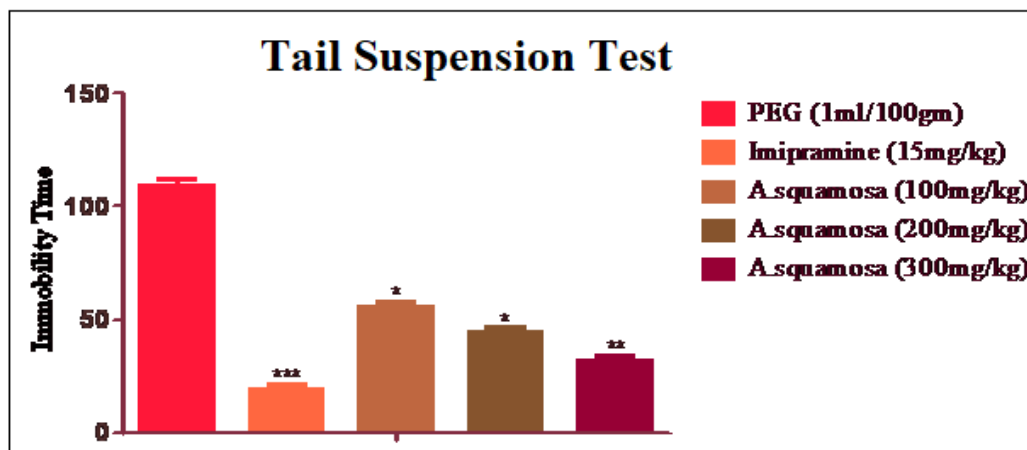
Fig. 2: Forced swim test result analysis.

TAIL SUSPENSION TEST (TST)

The total duration of immobility induced by tail suspension was measured according to the method described by Steru et al. Depression was produced by suspending the animal from the edge of a table 50 cm above the floor by an adhesive tape placed approx. 1cm. from the tip of the tail. Immobility time was recorded during a 6 min. period. Changes in the immobility duration were studied after administering drugs in separate groups of animals. The antidepressant activity was expressed as reduction in the immobility duration between the control, standard and animals treated with test drug as shown in **Tab.3** and **Fig.3**.

Tab. 3: Effect of ASRE on immobility period (sec) of rats using tail suspension test.

GROUP	DRUG	DOSE	IMMOBILITY TIME
I	PEG	1ml/100gm	109.40 ± 2.65
II	Imipramine	15mg/kg	19.00 ± 2.28***
III	Annona Squamosa	100mg/kg	55.80 ± 2.35*
IV	Annona Squamosa	200mg/kg	44.40 ± 2.46*
V	Annona Squamosa	300mg/kg	32.00 ± 1.87**

**Fig. 3: Tail suspension test result analysis.**

CONCLUSION

The present study was conducted for 14 days with administration of all the control, standard and test drugs to study the antidepressant activity. Results showed that the administration of the root extract of Annona Squamosa produced a diminution of immobility time in rats which were exposed to both forced swimming and tail suspension tests. Statistical significance was determined by analysis of variance using INSTAT statistical software.

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