

Comparative Analysis of the Anti-Epileptic Activity of *Annona Muricata* and *Artocarpus Heterophyllus* on MES Induced Seizures in Wistar Rats

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Abstract: The main objective of our assessment is the comparative study of the Anti Epileptic activity of *Annona muricata* and *Artocarpus heterophyllus* on MES induced seizures in Wistar Rats. Anticonvulsants (also known as antiepileptic drugs or recently as anti-seizure drugs) are a diverse group of pharmacological agents used in the treatment of epileptic seizures. Phenytoin is best standard drug for epileptic patients its belongs to Hydantoin derivatives. It works by decreasing abnormal electrical activity in the brain. Phenytoin is used to control seizures (convulsion), including tonic-clonic (grand mal) and psychomotor seizures, in the treatment of Epilepsy. The Hydro-alcoholic extracts of “*Annona muricata* and *Artocarpus heterophyllus*” were subjected to phytochemical analysis find out the presence and absence of phytochemical constituents. The phytochemical tests employed for “*Annona muricata* and *Artocarpus* were subjected to phytochemical analysis find out the presence and absence of Alkaloids, Protein, carbohydrates, flavonoids, other compounds found are tannins, saponins, terpenoids, glycosides. Results of the Present study show that the comparing Hydroalcoholic extract of *Annona muricata* and *Artocarpus heterophyllus*, *Annona muricata* leaves (400mg/kg) produced significant anticonvulsant effect against MES induced seizure in Rat.

Keywords: Epilepsy, Seizures, MES, Anti-convulsant.

1. Introduction

Indian Systems of Medicine are among the well known global traditional systems of medicine. It is a well-known fact that Traditional Systems of medicines always played important role in meeting the global health care needs.

India has the unique distinction of having six recognized systems of medicine in this category. Ayurveda, Siddha, Unani, Yoga, Naturopathy, Homeopathy.

Ayurveda, a natural system of medicine, originated in India more than 3,000 years ago. The term Ayurveda is derived from the Sanskrit words ayur (life) and veda (science or knowledge). Thus, Ayurveda translates to knowledge of life.

A. Epilepsy

Epilepsy is a central nervous system (neurological) disorder in which brain activity becomes abnormal, causing seizures or periods of unusual behaviour, sensations and sometimes loss of awareness.

B. Anti Epileptic Activity

Anticonvulsants (also known as antiepileptic drugs or recently as anti-seizure drugs) are a diverse group of pharmacological agents used in the treatment of epileptic seizures. Antiepileptic drugs suppress seizures, but do not cure the disorder, the disease may fadeout though after years of successful control. The aim of drugs is to control and totally prevent all seizure activity at an acceptable level of side effects. With the currently available drugs, this can be achieved in about half of the patients. Another 20-30% attains partial control, while the rest remain refractory. The cause of epilepsy should be searched in the patient, if found and treatable, an attempt to remove it should be made. There is a trend to prefer the newer antiepileptic drugs. However, the newer drugs are less well studied. Initiate treatment early, because each seizure episode increases the propensity to further attacks, probably by a process of akin to kindling. Start with a single drug, preferably at low dose-gradually increase dose till full control of seizures or side effects appear. If full control is not obtained at maximum tolerated dose of one drug, substitute another drug. For changing one antiepileptic drug to another, dose of the first drug should be gradually reduced and that of the second drug gradually increased till the second drug regimen is fully established. When therapy with two drugs fails to achieve adequate control, addition of a third drug generally does not improve the response, unless the patient suffers from more than one seizure types. Therapeutic regimen should be as simple as possible. A seizure diary should be maintained.

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C. Phenytoin

Phenytoin is best standard drug for epileptic patients it belongs to Hydantoin derivatives. Phenytoin is in a class of medications called anticonvulsants. It works by decreasing abnormal electrical activity in the brain. Phenytoin is used to control seizures (convulsion), including tonic-clonic (grand mal) and psychomotor seizures, in the treatment of epilepsy. It is also used to prevent and treat seizures that occur during brain surgery.

2. Methodology

A. Collection of Plant

Healthy and well grown leaves of selected plants "Annona muricata and Artocarpus heterophyllus" were collected in the month of October, from local area of Midalam, Kanyakumari district, Tamilnadu.

Artocarpus heterophyllus, commonly called jackfruit. Artocarpus heterophyllus prefers a warm, humid climate, it is more tolerant of cooler and drier conditions than other species within the genus mature trees have been known to tolerate mild drought and temperatures down to -3°C.A.

Artocarpus heterophyllus is considered to be a multi-purpose tree species, being valued for its fruits, timber and leaf fodder

The leaves were dried in a clean dry shade for 7 days, after 7 days it coarsely grinded mixer and mixer brought to the laboratory in a clean container.

B. Preparation of Plant Extraction

1) Maceration Method

Procedure:

Plant material and hydroalcoholic solvent placed in wide mouthed container which can be well stopper to prevent the evaporation of menstruum which is mostly concentrated alcohol.

- Two different plants are extract by two different container.
- The drug is place with the whole of the menstruum in a closed vessel for 7 days.
- During this period shaking is done occasionally.
- After 7 days liquid is stain and marc is pressed-in filter press, hydraulic press or hand press.
- Then filtered to make clear liquid.
- Final volume is not adjusted.
- The yield is collected separately.

C. Phyto-Chemical Analysis

The Hydro-alcoholic extracts of "Annona muricata and Artocarpus heterophyllus" were subjected to phytochemical analysis find out the presence and absence of phytochemical constituents. The phytochemical tests employed for.

1) Test for Alkaloids

Dragendroff's Test:

Take 2ml extract of Annona muricata was transferred into the test tube and 1ml of Dragendroff's reagent is added into the test tube presence of an orange red precipitate indicate the presence of alkaloids.

Take 2ml extract of Artocarpus heterophyllus was transferred into the test tube and 1ml of Dragendroff's reagent is added into the test tube presence of an orange red precipitate indicate the presence of alkaloids.

2) Test for Aminoacids

Ninhydrin Test:

Take 2ml extract of Annona muricata was transferred into the test tube and A few drops of the 2% ninhydrin solution must be added to this solution. The test tube must be kept in a warm water bath for approximately 5 minutes, no development of deep blue/violet colour indicates the absence of amino acids.

Take 2ml extract of Artocarpus heterophyllus was transferred into the test tube and A few drops of the 2% ninhydrin solution must be added to this solution. The test tube must be kept in a warm water bath for approximately 5 minutes, no development of deep blue/violet colour indicates the absence of amino acids.

3) Test for Protein

Millon's Test:

Take 2ml extract of Annona muricata was transferred into the test tube and add 3 drops of Millon's reagent, mix well, which is then heated gently. A reddish-brown coloration indicates the presence of proteins.

Take 2ml extract of Artocarpus heterophyllus was transferred into the test tube and add 3 drops of Millon's reagent, mix well, which is then heated gently. A reddish-brown coloration indicates the presence of proteins.

4) Test for Carbohydrate

Molisch Test:

Take 2ml extract of Annona muricata was transferred into the test tube α -naphthol was added to it & was mixed well. 2ml of conc. Sulfuric acid was then added along the side wall of tube. Purple colored ring was seen at junction of two liquids indicates the presence of carbohydrate.

Take 2ml extract of Artocarpus heterophyllus was transferred into the test tube α -naphthol was added to it & was mixed well. 2ml of conc. Sulfuric acid was then added along the side wall of tube. Purple colored ring was seen at junction of two liquids indicates the presence of carbohydrate.

D. Requirements for Pharmacological Activity

In this Epileptic Activity we have Selected 18 Wistar Rats.

- 1) Species and Strain: Wistar Rat
- 2) Age and Weight: 6 Months/180-200 gram
- 3) Gender: Male
- 4) Number to be used (Year wise breakups and total figures needed to be given in tubular form): 18 (6 groups x 3rats =18)
- 5) Number of days each animal will be housed: 4 weeks

3. Experimental Design

A. Maximal Electroshock Induced Seizures (MES) in Wistar Rats

The animals were chosen by preliminary screening. Rats which showed extension of hind limb were included in the

Table 1
Animals randomly pre-arranged into SIX groups of three animals

Group	Description	No. of Animals	Procedure
Group-1	Control	3	0.9%w/v of saline (10mg/kg)
Group-2	Standard control	3	Phenytoin (25mg/kg)
Group-3	Test Dose(plant-1)	3	Hydroalcoholic Extract of <i>Annona muricata</i> (200mg/kg)
Group-4	Test Dose (plant-2)	3	Hydroalcoholic Extract of <i>Artocarpus heterophyllus</i> (200mg/kg)
Group-5	Test Dose (plant-1)	3	Hydroalcoholic Extract of <i>Annona muricata</i> (400mg/kg)
Group-6	Test Dose(plant-2)	3	Hydroalcoholic Extract of <i>Artocarpus heterophyllus</i> (400mg/kg)

study. The seizures were induced by maximal electroconvulsimeter by passing current of 150mA for 0.2 second using ear clip electrodes. The drugs and distilled water were given one hour prior to induction of convulsion.

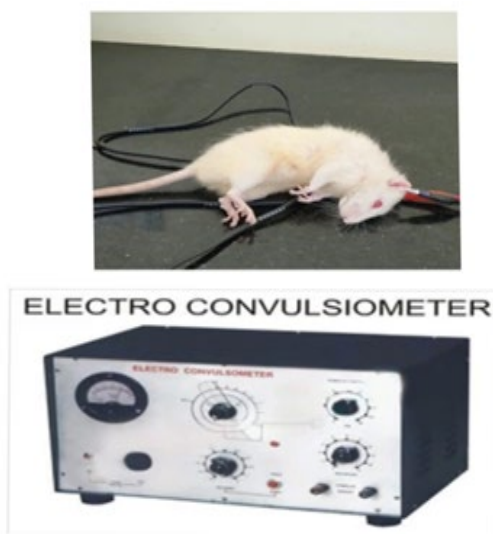


Fig. 1.

Table 2

Animal	Duration of various phases (times in sec.)					
	Flexion	Extension	Convulsion	Stupor	Recovery	Inhibition %
Control	1±0	2±0	14.33±0.87	21.33±1.76	512.33±18.67	-
Phenytoin(5mg/kg)	1.66±0.33	4±0.57	8±0.57	21.33±1.85	86±3.21	83.2%
<i>Annona muricata</i> (200mg/kg)	2±0.57	4±0.57	5.5±0.28	10±0.57	119.66±21.49	76.6%
<i>Annona muricata</i> (400mg/kg)	2±0.57	4±0.57	12±0.57	19±0.57	90.33±4.33	82.3%
<i>Artocarpus heterophyllus</i> (200mg/kg)	2±0.57	8±0.57	15±0.57	31±0.57	135.66±2.96	73.5%
<i>Artocarpus heterophyllus</i> (400mg/kg)	2±0.57	6±0.57	12±0.57	45±2.88	252.33±6.56	50.74%

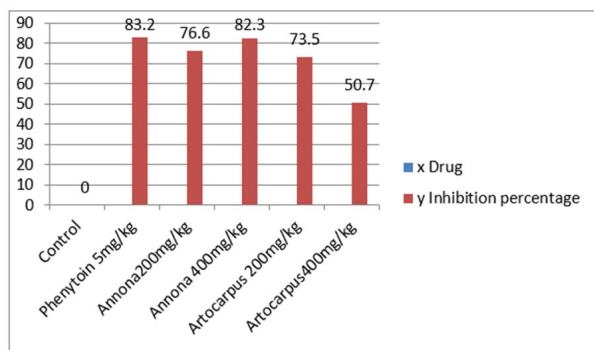


Fig. 2.

4. Conclusion

Results of the Present study show that the comparing Hydroalcoholic extract of *Annona muricata* and *Artocarpus heterophyllus*, *Annona muricata* leaves (400mg/kg) produced significant anticonvulsant effect against MES induced seizure in Rat.

These observations suggest that hydroalcoholic extract of *Annona muricata* and *Artocarpus heterophyllus* possibly act by modulating ion channels in CNS to exert their anticonvulsant effect and the results verify its traditional use in epilepsy convulsion further phytochemical studies are in progress to isolate, characterize and identify the specific active compounds in their plant responsible for Anti-Convulsant Activity.

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