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EVALUATION OF ANALGESIC ACTIVITY OF METHANOLIC LEAF EXTRACT OF *ARGYREIA CUNEATA WILLD.* (CONVOLVULACEAE)

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ABSTRACT

Argyreia cuneata is a powerful medicinal plant in the Indian system of medicine. Traditionally it is used as an Antidiabetic, Fertility enhancement, Nervous system tonic, etc. The present study evaluated analgesic activity of leaf methanolic extract of A. cuinata by using Eddy hot plate method and Heat conduction method. The study may have concluded that the leaf methanolic extract of A. cuinata at the dose of 100,200,400 mg/kg showed the significant (p<0.01) analgesic activity.

KEY WORDS

Methanolic Leaf Extract, Argyreia cuneata

INTRODUCTION

Therapeutic use of medicinal herbs for relieving pain has been reported from time immemorial (Almeida *et al.*, 2001). The study of plant species traditionally used as pain killers can be seen as a fruitful research strategy in the search of new analgesic drugs. A commonly available analgesic drug is known to cause harmful side effects (Bhavesh *et al.*, 2015).

Argyreia cuinata (Convolvulaceae) commonly known as vryddhadaru in Sanskrit is a woody climber and has been used as a traditional Ayurvedic system of medicine. The leaf of this plant have been regarded as alternative and tonic, and are said to be useful in cardiovascular problems, liver disorders, central nervous system, antidiabetic activity, fertility enhancement, digestive and metabolic activity in the present study deals. Pain is a condition which is regularly dealt with in daily clinical practice. (Kattula Rajkumar,*et al*., 2017) Hence, any attempt to contribute an easily available analgesic drug from the available flora is always accepted without any reluctance. *A. cuinata* has been traditionally used by the tribals of middle Tamilnadu to cure specific ailments. This attempt is to prove the efficacy of the plant extract as a potential analgesic drug and to demonstrate a positive result. Search for safe herbal remedies with potent analgesic activity received momentum recently as the available analgesic, such as paracetamol, aspirin, nimusulide etc. have toxic effect to the various organs of the body (Fayyaz *et al*., 1992)

MATERIALS AND METHODS

Plant leaves were collected from Parumal mudimalli, Coimbatore. Identification of Department of Botany Kongunadu arts and Science College, Coimbatore. And the voucher spacemen as been preserve for farther reference.

Preparation of Extract:

The leaves were washed on under running tab water, air dried and shad coarsely powdered and the methanolic extract was prepared maceration. There were they pulverized, and powder passed through 100 mesh sieve and then stored in an air tight container. 50g of the plant powder was extracted with 250ml of methanol by the sox let extractor for 9-10 hours. The concentrated residue was stored in the refrigeration at 4°c and it was used for further studies.

Experimental animals

The male albino rats were obtained from the animal house, PSG Institute of Medical Science, Coimbatore India. Feed (standard pellet diet) and water were supplied *ad libitum*. Their housing was maintained at a temperature of 20-24ºC, relative humidity of 50-70%, and a 12 h light/dark cycle. Rats had been housed in four groups of five in the same cage for 1 week before treatment. The experimental protocol has been approved by the Institution Animal Ethics committee and by the Regulatory body of the government (659/02/a/CPCSEA).

Acute toxicity study

For the pharmacological tests, the plant extract was suspended in double distilled water containing carboxyl methyl cellulose (1% w/v, CMC). The acute toxicity was determined for the methanolic extract of *A. cuinata* on albino rats by fixed dose method. 100-1000 mg/kg of methanolic extracts of *A. cuinata* was administered by oral route to rats. Mortality was observed for 3 days.

Assessment of Analgesic activity:

Experimental animals

Male albino rats were obtained from the animal house, Agricultural University, Trissur, Kerala. Feed (standard pellet diet) and water were supplied *ad libitum*. Their housing was maintained at a temperature of 20-24ºC, relative humidity of 50-70%, and a 12 h light/dark cycle. Mice had been housed in four groups of five in the same cage for 1 week before treatment. The experimental protocol has been approved by the Institution Animal Ethics committee and by the Regulatory body of the government (659/02/a/CPCSEA).

Analgesic activity *A. cuinata* Extract in albino rat by Eddy's hot plate and heat conduction method.

Eddy's hot plate method

The animals were divided into following six groups of 6 rats each

Group I: served as control.

Group II: served as standard and were injected Diclofenac sodium (9 mg/kg) Intraperitonially.

Group III: Rats were treated with 100 mg/kg of *A. cuinata* extract on the day of this experiment by orally by using an intragastric catheter tube (IGC).

Group IV: Rats were treated with 200 mg/kg of *A. cuinata* extract on the day of this experiment by orally by using an intragastric catheter tube (IGC).

Group V: Rats were treated with 400 mg/kg of *A. cuinata* extract on the day of this experiment by orally by using an intragastric catheter tube (IGC).

The animals were individually placed on the hot plate maintained at 55°C, one hour after their respective treatments. The response time was noted as the time at which animals reacted to the pain stimulus either by paw licking or jump response, whichever appeared first. The cut off time for the reaction was 15 seconds.

Heat conduction method

The animals were divided into six groups of 6 rats each.

Group I: served as control given 0.9% saline by IGC

Group II: served as standard and were injected Diclofenac sodium (9 mg/kg) Intraperitonially (IP).

Group III: Rats were treated with 100 mg/kg of *A. cuinata* extract on the day of this experiment by orally by using an intragastric catheter tube (IGC).

Group IV: Rats were treated with 200 mg/kg of *A. cuinata* extract on the day of this experiment by orally by using an intragastric catheter tube (IGC).

Group V: Rats were treated with 400 mg/kg of *A. cuinata* extract on the day of this experiment by orally by using an intragastric catheter tube (IGC).

After one hour, the tip of tail was dipped up to 5 cm into hot water maintained at 58°C. The response time was noted as the sudden withdrawal of the tail from the hot water. Cut off time of 10 seconds was maintained to avoid damage to the tail for all groups. The time required for flicking of the tail, was recorded, to assess response to noxious stimulus (Kulkarni, 1999) and re-modeling in all groups.

RESULTS AND DISCUSSION:

Analgesic effect of the extracts was demonstrated in the experimental models using Eddy Hot Plate Method and Heat conduction method using thermal stimuli. The results were significant at $p < 0.001$ for both Eddy's Hot plate method and Heat conduction method. The analgesic activity is presented in table 1. An increase in reaction time and decrease in writhing are generally considered an important parameter of analgesic activity in Heat conduction method and Acetic acid Induced Writhing Test respectively. The analgesic activities of some secondary metabolites of flavanoids and terpenoids has been already reported which suggested that similar phytoconstitution may be responsible for this extract (La Fuente *et al*. 2001).

Studies did not reveal that toxic symptoms are death in animals up to the dosage of 2000 mg/kg. Body weight was in methanolic extract. The leaf methanolic extrat of *A. cuinata* show significantly analgesic activity as

evidence by the increasing in reaction time to the pain stimulus. The results were significant at $p < 0.001$ for both Eddy's hot plate method and Heat conduction method.

Natural products are a source for bioactive compounds and have potential for developing some novel therapeutic drugs. The central analgesic activity of methanolic extracts of *A. cuinata* was assessed using Eddie's hot plate method. The leaves extracts have exhibited a significant analgesic activity at the dose of 100 mg/kg body Weight. The hot plate test was selected to investigate central analgesic activity because it has sensitivity to strong analgesic and limited tissue damage. Prostaglandins and bradykinins may play an important role in pain process. This method is considered to be selective for the drugs acting on central nervous system. It is an established fact that any agent that causes a prolongation of the hot plate latency using this test must be acting centrally (Ibironke and Ajiboye, 2007).

The plant extracts of *A. cuinata* has exhibited both types of pain inhibition. Phenolic compounds are reported to inhibit prostaglandin synthesis. A number of Phenolic compounds have been reported to produce analgesic activity (Hosseinzadeh *et al.*, 2008). The analgesic effect of the plants in both models suggested that they have been acting through central and peripheral mechanism (Sabina *et al.*, 2009). These results indicate that methanolic extract of *A. cuinata* could produce a significant analgesic effect. As far as the analgesic effects are concerned our results supports the claims about this plant as in folk medicine. Studies on acute toxicity did not reveal any toxic symptoms or death in any of the animals up to the dose of 2000 mg/kg body weight. Methanolic extract of *A. cuinata showed* significant analgesic activity evident by the increasing reaction time to the pain stimuli.

Result was significant at the $p < 0.001$, $p < 0.01$ for both studies Edi hot plate method and Heat conduction method. The study presented in Table 1. Methanolic extract compared to the stranded drug diclofenac.

Table1. Analgesic activity of *A. cuneata* leaf methonol extract on the adult albino

Groups	Treatment		Response Time in sec (Mean ± SEM)	
	Drug	Dose	Eddy Hot Plate Method	Heat Conduction Method
Group I	Saline	0.9 mg/dl	3.93±0.163	2.56±0.112
Group II	Diclofenac	9 mg/kg	16.38±0.284***	13.27±0.103***
Group III	AC extract	100 mg/kg	9.82±0.127**	9.56±0.118**
Group IV	AC extract	200 mg/kg	18.12±0.192***	11.22±0.216***
Group V	AC extract	400 mg/kg	21.15±0.226***	16.12±0.151***

The data were expressed as mean ± S.E.M; Tukey Kramer multiple comparison test: ***p<0.001, **p<0.01 (Extracts vs. control)

Group I: Rats received normal saline as a control on the day of experiment by using an intragastric catheter tube (IGU).

Group II: Rats received 10 mg/kg of Diclofence which was considered as standard drug on the day of this experiment by intraperitonialy.

Group III: Rate treated with *A.cuneata* leaf methonol extract (100mg/kg) on the day of this experiment by using IGC.

Group IV: Rats treated with *A.cuneata* leaf methonol extract (200mg/kg) on the day of this experiment by using IGC.

Group V: Rats treated with *A.cuneata* leaf methonol extract (400mg/kg) on the day of this experiment by using IGC.

CONCLUSION:

It is concludes that present study was investigated to the methanolic leaf extract of *A. cuinata* has demonstrated that this plant is significant analgesic properties and it's justifies the traditional use of this plant in the treatment of were as types of pain.

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