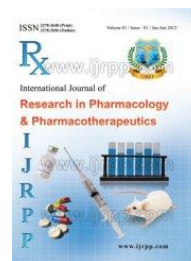




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Antispasmodic activity of *Calotropis Procera* leaf extract -An *invitro* study in rat colon

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ABSTRACT

Calotropis procera has number of medicinal importance as it contains a number of active constituents like cardiac glycosides, terpenes, tannins flavinoids etc. it has also been found to have antispasmodic property. Therefore the present work was undertaken to evaluate the antispasmodic effect on different isolated tissues. *Invitro* models: isolated rat colon by using bioassay techniques. In contrast to the findings of *c.procera* ethnolic extract on rat colon produced antispasmodic effect on the gastrointestinal smooth muscles. *Invitro* studies of rat colon the ethnolic extract of *c.procera* leaves of 10 mg/ml was added individually and along with acetylcholine, 5-HT and carbachol produced contraction was inhibited by this crude extract (30%, 31%, 81.56%, .89.54% 82%, and 56.25%, 25.71%, 30.43%, 53.84%). hence extract showed excellent antispasmodic activity.

Keywords: Antispasmodic, Rat Colon, *C.Procera*, 5 HT, Ach, Carbachol.

INTRODUCTION

Systematic investigation of drugs used in indigenous medicine in India on modern scientific lines was started more than 30 years ago¹. A number of important medicinal plants prescribed by kavirajas and hakims have been investigated. The constituents have been examined, pharmacological action of the active principles worked out by animal experimentation². *Calotropis procera* is a ever green plants used in traditional medicine for its antimicrobial, antifertility, anticancer, leprosy and anthelmintic³. the leaves are reported to cure

abdominal pains, while the aqueous extract of dried latex and chloroform extracts of the roots had been shown to exhibit analgesic antipyretic and anti-inflammatory activities, besides it has been shown to exhibit emetic, spasmogenic and carminative properties⁴.

The latex is reported to afford protection against castor oil induced diarrhea in rats, dry latex produced spasmogenic effect on the gastrointestinal smooth muscles⁵. Such an effect could have resulted due to presence of histamine or due to release of biogenic amines, such as serotonin and histamine from the mast cells. Spasmogenic effect *invitro* was possibly

due to gastrointestinal tract receptors (mediated through histamine) located outside the myentric plexus (which acts on H3 receptors)⁶. The different

parts of the plant contain alkaloids, cardinolides, terpenes and cyclisadol.

Table: 1 Rat as an experimental animal⁷

Content	Description
Scientific name	Rattus norwegius
Commonly used strain	Albino rats- preffered because of easy handling, sensitivity and low cost
Subgroups	Sprague dawley- have longer and narrow head with tail length longer than body length Wistar - have wide head and long ears with tail length less than body length
Important points	Do not have tonsil and gallbladder Have diffuse pancreas (not useful as IDDM model) Coprophagy-eat their own stools, Tail helps in thermoregulation.
As experimental animal	Testing of psychopharmacological agents Employed for studies on hypertension ,gastric secretion and analgesic effect of the drugs, Study the toxicity studies, teratogenicity and carcinogenicity of drugs. Used in neurosciences, immunogenetics, transplantation and cancer risk assessment.
Uses of isolated tissue	Uterus, stomach and colon are routinely employed for study of drug actions.

MATERIALS AND METHODS

The fresh leaves were collected from the c.procera air dried and powdered material was subjected to soxhlet with ethanol (95%)⁸

Ethnolic extract was subjected to identification of constituents.

Preparation of extract: the ethnolic extract was suspended in tween -80(1%) and was preserved in desiccator till further in-vitro studies.

Standard drugs for comparison studies: acetylcholine hydrochloride, scopolamine, histamine, serotonin.

Isolated muscle preparations: guinea pig ileum, rat colon rabbit jejunum.

Physiological salt solution: tyrode/Krebs/de jalons solution.

Isolated rat colon

The adult rat is selected and fasted for 18 hrs with ad litrism. This serves to provide an emptier and clearer color. The rat is sacrificed and abdomen opened immediately. the right flexure i.e. sub hepatic region where the ascending colon turns to become transverse colon, is cut opened and placed in a container i.e. containing a modified ringer solution. The lumen is gently cleaned out using the

physiological salt solution⁹. The segment of about 4 cms is isolated and mounted in a organ bath provided with aeration, physiological solution and temperature of 37 c. especially this procedure is more convenient for performing the adrenaline bioassay. Graded doses of adrenaline are used to produce inhibition of standard carbachol induced contraction. The degree of inhibition is considered as response to alternative^{8,9}. The method is easy convenient and fairly sensitive. Generally with bracketing method the bioassay can be performed. The usual spontaneity seen is dampened by using a modified ringer solution with less calcium as perfusion fluid¹⁰.

Effect of C.Procera on isolated Rat Colon

Set up an isolated preparation of rat colon as per standard protocol. Elicit responses to carbachol such that we can record maximum height of contraction. Add 10 mg of c.procera ethnolic extract of leaves and record its response. Similarly elicit responses to carbachol in presence of 0.1, 0.2, 0.3 and 0.4 ml of C.procera crude extract. Observe the degree of inhibition and calculate percentage of inhibition of acetylcholine and histamine is related to c.procera crude extract.

RESULTS

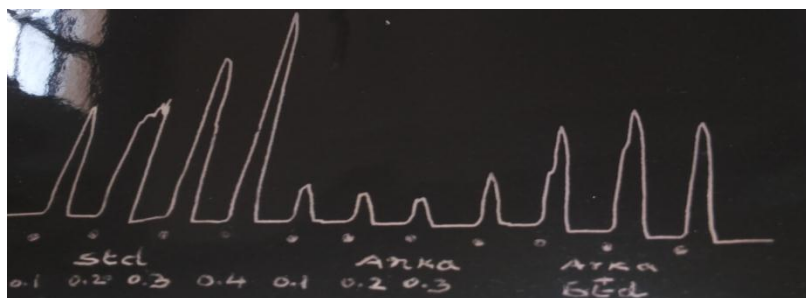
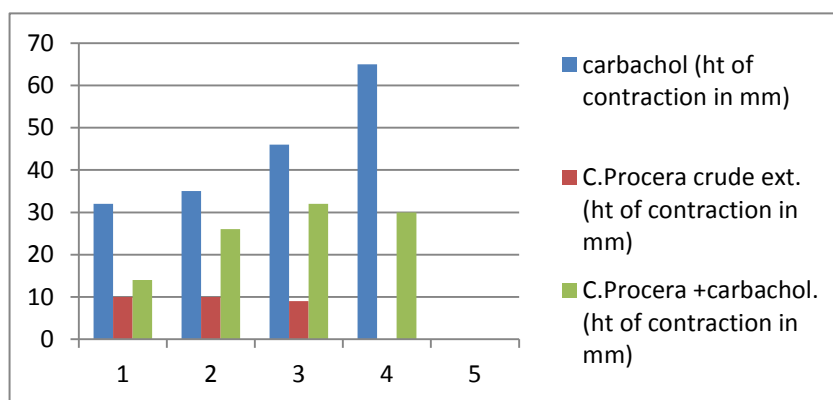


Table 2 :Inhibition of carbachol induced contraction by *C.Procera* leaves ethnolic extract on rat colon.

carbachol (ht of contraction in mm)	C.Procera crude ext. (ht of contraction in mm)	% of duration	C.Procera +carbachol. (ht of contraction in mm)	% of inhibition
32	10	68.75	14	56.25
35	10	42.85	26	25.71
46	9	76.08	32	30.43
65	-	100	30	53.84

Graph 1: showing the responses of various drug combinations on rat colon



DISCUSSION

In the present work the photochemical evaluation of *c.procera* was performed .after the extraction with ethanol the pharmacological investigations of the ethnolic extract of *Calotropis procera* leaves was studied on rat colon¹¹.

In the photochemical evaluation the ethnolic extract of *c.procera* leaves contains saponins, glycosides, flavinoids, carbohydrates, reducing sugars (upon acid hydrolysis).

The aqueous extract and ethnolic extract contains saponins, glycosides, flavinoids, carbohydrates. This was confirmed by performing the specific chemical tests

In-vitro studies of rat colon preparations, the ethnolic extract of *c.procera* leaves of 10mg/ml was used to study and its same concentration when it was added individually and along with acetylcholine solutions, we observe the inhibition of acetylcholine induced contractions (56.25%, 25.71%, 30.43% and 53.84%) In contrast to our findings of effect on rat colon the ethnolic extract of *c.procera* leaves produced antispasmodic effect on gastrointestinal smooth muscles^{12,13}. This type of effects are exerted due to 5HT / histamine receptor might be blocked and enhance the inhibiting activity¹⁴.

CONCLUSION

Thus our study shows that ethnolic extract of c.procera leaves produces an excellent antispasmodic

effect on the gastrointestinal smooth muscles of rat colon.

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