



ANTI-ULCER ACTIVITY OF CASSIA SIAMEA USING ETHANOL INDUCED GASTRIC ULCER IN RAT

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ABSTRACT

Background: An ulcer is a sore which means an open painful wound in mucous membranes or mucosal linings of the body. The cause of ulceration in patients is mainly due to hyper secretion of gastric juice and pepsin. In present, the peptic ulcer is seen among many people. The two most common type of peptic Ulcer are called "Gastric ulcer" and "duodenal ulcer". **Objective:** The objective of the study is determining the antiulcer effect from the fresh juice of rhizome of cassia siamea. The preliminary phytochemical screening of whole plant extract was indicates in potential in Antiulcer activity. Pantoprazole used as a standard comparison agents. **Materials and Methods:** Albino wistar rats of both sex having (150-200g) are divided into 5 groups of 6 animals each. They are housed in individual cages and fasted for 24hrs allowing free access of drinking water. Ulceration was induced in 36hrs without feeding the rat by the administration of 80% of ethanol orally in a dose of 1ml for each rat. **Result:** Ethanolic extract exhibited significant ($p < 0.001$) antiulcer activity in ethanol induced gastric ulcer model. An antiulcer effect of ethanolic extract of cassia siamea have potential ability of Anti-ulcer activity.

KEYWORDS: Anti-Ulcer, Cassia Siamea, Ethanol Extraction, Gastric Ulcer.

1. INTRODUCTION

ULCER are an open sore of the skin or mucus membrane characterized by sloughing of inflamed dead tissue. Ulcer are lesions on the surface of the skin or a mucous membrane characterized by a superficial loss of tissue. Ulcers are most common on the skin of the lower extremities and in the gastrointestinal tract, although they may be encountered at almost any site. Of these peptic ulcer is seen among many people. The two most common type of peptic ulcer are called "gastric ulcer" and "duodenal ulcer". Gastric ulcer are located in the stomach, characterized by pain; ulcers are common in older age group. Patients with gastric ulcers have normal or diminished acid production, yet ulcers may occur even in complete absence of acid.

Duodenal ulcers are found at the beginning of small intestine and are characterized by severe pain with burning sensation in upper abdomen that awakens patients from sleep. In the duodenum, ulcers may appear on both the anterior and posterior walls.^[4] In some cases, peptic ulcer can be life threatening with symptoms like bloody stool, severe abdominal pain, and cramps along with vomiting blood. The pathophysiology of peptic ulcer disease involves an imbalances between offensive (acid, pepsin, and *Helicobacter pylori*) and defensive

factors (mucin, prostaglandin, bicarbonate, nitric oxide, and growth factors).

The Gram-negative bacterium *Helicobacter pylori* remains present between the mucous layer and the gastric epithelium and is strategically designed to live within the aggressive environment of the stomach. Initially, *Helicobacter pylori* resides in the antrum but over time migrates toward the more proximal segments of the stomach.

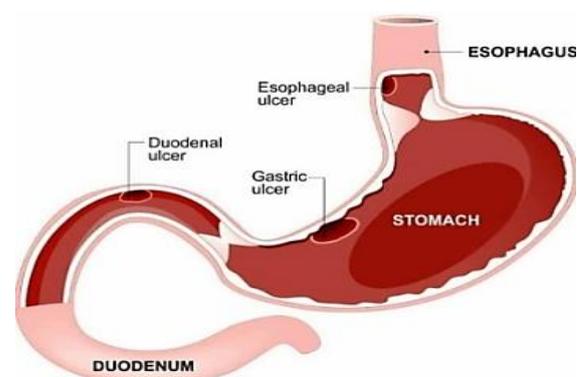


Fig. No. 1: Ulcer in stomach.

1.1 Ulcer (In Short)

A break in the epithelial continuity

Discontinuity of the skin or mucous membrane which occurs due to the microscopic death of the tissues.

Types:

1. Stomach – Gastric ulcer
2. Duodenum – Duodenal ulcer
3. Oesophagus – Oesophageal ulcer

Stomach ulcer (Gastric ulcer/Peptic ulcer):

Peptic ulcer disease (PUD) is a break in the lining of the stomach, the first part of the small intestine, or sometimes the lower esophagus. An ulcer in the stomach is called a gastric ulcer, while one in the first part of the intestines is a duodenal ulcer. Stomach ulcers are usually caused by *Helicobacter pylori* (*H. pylori*) bacteria or NSAIDs (Ibuprofen, Naproxen sodium, etc...). These can break down stomach's defence against the acid it produces to digest food allowing the stomach lining to become damaged and an ulcer to form.

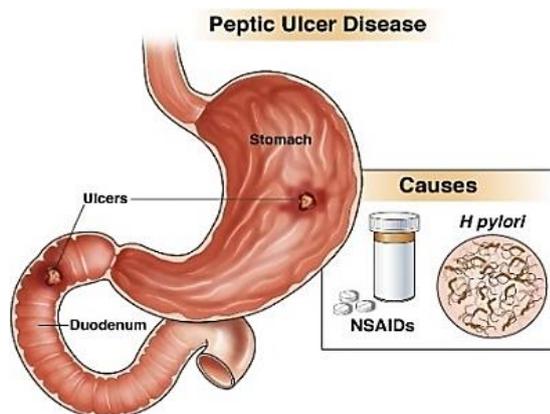


Fig. No. 2: Causes of peptic ulcer.

Types of peptic ulcer:

- TYPE1: Ulcer along the lesser curve of stomach.
 TYPE2: Two ulcers are present-one is gastric ulcer and other one is duodenal ulcer
 TYPE3: Prepyloric ulcer.
 TYPE4: Proximal gastroesophageal ulcer.
 TYPE5: Anywhere

1.2 Anti-ulcer activity of cassia siamea using induced gastric ulcer in rat

Duodenal ulcer:

The main cause of the damage is infection with bacteria called *H.pylori*. The bacteria can cause the lining of your duodenum to become inflamed and an ulcer can form. Some medications can also cause duodenal ulcer, particularly anti-inflammatory drugs such as Ibuprofen and Aspirin.

Esophageal ulcer:

It is a type of peptic ulcer. It is a painful sore located in the lining of the lower part of the esophagus, at the junction of the esophagus and stomach. Esophagus is the tube connecting throat to the stomach.

Mouth ulcer:

Mouth ulcers are small sores or lesions that develop in the mouth or the base of your gums. They are commonly known as canker sores.

Foot ulcer:

A foot ulcer is a damaged area on the foot that either does not heal or keeps returning. A breakdown of the skin or tissues results in an open sore that becomes infected as well as the visible sore.

2. Plant profile:

Senna siamea, also known as Siamese cassia, kassod tree, cassod tree and cassia tree, is a legume in the subfamily Caesalpinioideae. It is native to South and Southeast Asia, although its exact origin is unknown. It is a medium-size, evergreen tree growing up to 18 m with yellow flowers.

- **Scientific name:** *Senna siamea*
- **Higher classification:** *Senna*
- **Family:** Fabaceae
- **Subfamily:** Caesalpinioideae
- **Order:** Fabales
- **Kingdom:** Plantae



Fig. No. 3: *Senna siamea*.

3. MATERIALS AND METHODS

3.1 Chemicals:

All the chemicals and reagents used in the study were of analytical grade and procured from reputed Indian manufacturers.

3.2 Collection and Authentication of plant:

The whole plant of *cassia siamea* were collected from the natural habitat in and local area, Tamil nadu and the plant material were authenticated by Prof. Dr. P. Jayaraman Ph.D., The Director Plant Anatomy Research Centre(PARC), West Thambram, Chennai-45.

3.3 Phytochemical screening:

Extraction:

The collected plants were cleaned, dried in the shade and ground in to fine powder from which 500g was extracted repeatedly with 2 litres of ethanol using Soxhlet extractor at 50°C for 72 h. The extracts were filtered using

whatman filter paper (no.1) and concentrated in vacuum at 40°C using a rotary evaporator and the residues obtained was stored in a freezer at -80°C until further tests.

The plant may be containing the following compound such as carbohydrate, protein, and lipids. That is utilized as food by man. It also contains the compound like. Tannins, glycosides, alkaloids, Volatile oils. The compound that is responsible for lots of medicinal properties.

3.4 Pharmacological screening animals:

The albino rat (average body weight 200-300g), used from in house laboratory. The animals were maintained under standardized environment conditions (22-88°C), 60-70% relative humidity, 12 hour dark/light cycle) in animal house, Department of pharmacology, Aadhibhagawan college of pharmacy. The animals were provided with standard mouse chow (Sai Durga Feeds and Foods, Bangalore, India) and water ad libitum. All animals experiments were conducted during the present study got prior permission from Institutional Animals Ethics Committee (IAEC approved) and following the guidelines of Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) constituted by the Animals Welfare Division, Government of India (no.IAE).

Ethanol induce gastric ulcer:

Albino Wister rats of both sex having (150-200g) are divided in to 5 groups of 6 animals each. They are housed in individual cages and fasted for 24hrs allowing free access to drinking water. Care being taken to avoid coprophagy. Ulceration was induced in 36hours without feeding the rats by the administration of 80% ethanol orally in a dose of 1ml for each rat. Test and Standard is given each dose level of rat, one hour before the ethanol administration. After two hours of ethanol administration, animals will be sacrificed by CO₂ poisoning. The stomach is dissected out, opened along the greater curvature and the contents are drained in a centrifuge tube and were centrifuged at 1000rpm for 10 minutes and the volume is noted. The pH of the gastric juice is recorded by using a pH meter. Then the contents are subjected to analysis for free and total acidity. The stomachs are then washed with running water so see for ulcers in the glandular portion of the stomach are noted and severity of the ulcers scored microscopically with the help of 10x lens.

4. RESULTS AND DISCUSSION:

4.1 Preliminary phytochemical screening:

Cassia siamea extract juice was subjected various chemical tested as per the standard methods for the identification of the various constituents. The results if the phytochemical analysis is tested below

Table No. 1: Preliminary Phytochemical Screening +Ve indicates presence and -ve indicates absence.

S. NO.	Constituents	Ethanollic Extract
1.	Alkaloids	+
2.	Carbohydrates	-
3	Protein	+
4	Terpenoids	-
5	Phenols	-
6	Tannins	-
7	Flavonoids	+
8	Glycosides	-

4.2 Pharmacological screening animals:

Table 2: Dose Dependent Studies of CSEJ Using Ethanol Induced Ulcer Rat Model.

S. No	Treatment	No of animal	Dose	Ulcer index	Total Acidity (ml)	Acid Volume (ml)	PH
1	Control (water)	6	-	10.75±0.20	112.1±1.13	7.33±0.21	2.3±0.15
2	Pantoprazole	6	1.5mg/kg	4.60±0.32**	57.5±0.74**	4.63±0.32**	4.7±0.15**
3	CSEJ	6	1.5mg/kg	7.55.10±0.38	86.5±0.32*	5.05±0.10*	3.22±3.04
4	Control (glutathione)	6	2ml/kg	4.41±0.002*	62.2±0.416*	5.04±0.08*	3.05±4.67**
5	CSEJ	6	4ml/kg	4.55±0.10**	53.3±0.21**	4.02±0.04**	4.02±2.3**

- He values were expressed as mean ± S.E.M(n=6 animals in each group)
- Indicates significance P<0.05, P<-0.01 & P<0.001 when compared to control.
- P <0.05 & P <0.01. Data was analysed by one-way ANOVA followed by dunett test.

5. SUMMARY AND CONCLUSION

The plant cassia siamea were widely distributed in india and srilanka. The plant have been studied its Anti-ulcer activity but the anti-ulcer effect of fresh juice have been never studied. Hence the study is determining the Anti-ulcer effect from the juice of rhizome of cassia siamea

The results get from these study have been shown that extract juice of rhizome of cassia siamea produced antiulcer effect in ethanol induced Ulcer models. The results analyzed from the present study have indicates that CSEJ possesses Anti-ulcer effect on ethanol induced ulcers.

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