

The Methanolic Extract of FICUS HISPIDA Leaves Purgative Effect on Chicken Ileum in Vitro

Kuchekar S. D^{1*}; Dr. Panaskar A.N²; Dr. Panaskar B. A³; Bhosale R.D⁴; Jadhav R.M⁵
Valkunde R.M⁶; Dupade R.D.⁷; Pinjari E.E.⁸
Padmini College of Pharmacy, Dighanchi, Tal-Atpadi, Dist-Sangli, Maharashtra,
India-415315

Corresponding Author:- Kuchekar S. D^{1*}

Abstract:- *Ficus hispida* (FH) Linn is a year-round moderate-sized tree that is grown in the wild or under cultivation for its tasty fruits and cultural significance. It can be found all over India's subtropical regions. The purpose of this study was to assess the *Ficus hispida* leaf methanolic extract's in vitro purgative efficacy on chicken ileum. Anti-inflammatory, anti-emetic, anti-ulcer, cardioprotective, wound-healing, antifungal, antimicrobial, purgative, anti-diarrheal, and spasmodic properties are among the uses for this plant. Numerous phytochemical categories, including alkaloids, carbohydrates, proteins, amino acids, phenols, flavonoids, glycosides, fat, and fixed oil, are among the many different types of bioactives found in *Ficus hispida*. Additionally, a phytochemical investigation was done to determine which active ingredients possessed purgative properties.

Constipation is treated with laxatives to encourage the emptying of faces. Saline purgatives are salts with strongly charged ions that stay inside the bowel's lumen or route because they are unable to move through biological membranes with ease. Sodium sulphate, magnesium hydroxide, and magnesium sulphate are a few salts that are frequently utilised.

- The fluid moves from the lumen into circulation through the process of osmosis in a hypotonic solution, which causes the tissue to shrink.
- Hypertonic solution, which causes tissue swelling by transferring fluid from the cell into the lumen.
- In cases where there was no fluid movement across the intestinal barrier when using an isotonic solution.

Keywords:- Purgative Activity, *Ficus hispida*, Methanolic Extract.

I. INTRODUCTION

Purgatives are drugs that promote bowel movement and loosen faeces. Bulk purgatives, face softeners, stimulant purgatives, and osmotic purgatives are among the remedies and preventative measures for constipation. Because of their osmotic effect, osmotic (saline) purgatives are inorganic salts containing non-absorptive ions that hold water in the intestinal lumen. This results in the formation of soft or even

watery stools. Salts that contain highly charged ions and are unable to pass readily across cell membranes are known as saline purgatives.

- Hypertonic solutions are defined as those in which the concentration of solutes outside a cell is greater than that inside. This results in the fluid moving from the lumen into circulation through the process of osmosis, shrinking the tissue in the process.
- A hypotonic solution is one in which the fluid is transferred from the cell into the lumen, causing the tissue to enlarge. It contains less solutes than a cell.
- A solution that has the same concentration of salt as blood cells is said to be isotonic. where there was no fluid flow across the intestinal barrier in the case of the isotonic solution.¹

Typically, purgatives and spasmodic medications are used to treat constipation. The majority of children worldwide usually have digestive system complaints, which are preventative in nature. These conditions include functional abdominal pain, ulcerative colitis, irritable bowel syndrome (IBS), infantile colic, and constipation in addition to gastroenteritis and acute gastrointestinal sickness. Digestive system disorders have been linked to increased anxiety and depression risk as well as a reduced quality of life.² The hallmark of the illness is constant or recurrent stomach pain, which in IBS patients can be made better or worse by changing bowel habits.³ IBS is also associated with irregularities of intestinal movement in addition to symptoms like discomfort, constipation, or diarrhoea. Watery, loose stools are a common symptom of diarrhoea in people.⁴ However, several of these variables—such as gender, resistance to certain formulas, nursing, mental stress, or a history of gastrointestinal problems—have not been connected to variations in results.⁵ Ulcerative colitis (UC) is another gastrointestinal ailment characterised by limited inflammation and changes in the morphology of the colon.

In patients with ulcerative colitis (UC), mucosal inflammation is frequently the only area affected, and the degree of ulceration, bleeding, and edema varies with colon length. A histological investigation has linked individuals with UC to mucosal gland deformity, crypt abscesses, goblet cell depletion, acute and chronic mucosal

inflammation caused by polymorph nuclear leukocytes and mononuclear cells. Crohn's disease is another inflammatory bowel disease that can affect the gastrointestinal tract (GIT) from the oropharynx to the perianal region.⁶

This review therefore provides a thorough description of gastrointestinal disorders, covering their pathophysiology, the use of bioactive substances obtained from medicinal plants, and the possibility of spasmodic effects. Additionally, we showcased a group of fifteen traditional medicinal herbs with varying chemical compositions and pharmacological activity levels. diarrhoea, constipation, and indigestion. Visceral hypersensitivity may manifest in patients with GI irritation. Additionally, it has been shown that GI patients, particularly those who are exposed to weather swings and typically consume ice goods, have lower sensory thresholds for constipation, diarrhoea, and stomach pain.^{7,8}

II. MATERIALS AND METHOD

A. Plant Collection, Authentication and Extraction

➤ Plant Material:-

Fresh *Ficus Hippida* leaves were gathered in and around Atpadi, Maharashtra, following verification by the Botany Department's **Prof. Sharmila Yadav. Ishwarrao More Patil Mahila Mahavidyalaya Ektanagar Dighanchi Atpadi arts, commerce, and science.** A voucher specimen has been placed in the college museum.

➤ Preparation of Extract:⁹

- Plant collection and authentication In the month of February, locals harvested the leaves of *F. Hippida*.
- Desiccating and shrinking plant material In the lab, the leaves of *F. Hippida* were dried in the shade. It was ground up into a rough powder. As shown in Fig. 1, the coarse leaf powder was sieved No. 18 and kept in a cool, dry location to maintain consistency.
- Plant extraction Soxhlation's technique carried on the extraction of plants. The extraction process used a Soxhlet device with petroleum ether and methyl alcohol as the solvent. The yield achieved was determined to be 18% after 60g of coarsely dried powdered leaves were Soxhlet using petroleum ether for the purpose of defatting for 72 hours.
- For future research, the raw methanolic extract was kept in a refrigerator at or below 10°C. The METCF (methanolic extract of *Ficus hippida* leaves) was used in the sub sequent investigations



Fig 1 Soxlet Methanoli Extract of *Ficus Hippida*

B. Isolation of Chicken Ileum:¹⁰

The present restrictions on research involving laboratory animals have prompted a search for substitute tissues for biological testing. It was proposed to use tissues from animals including fish, sheep, goats, and cattle that are commonly eaten as food. We examined the ileum from chicks offered as food sacrifices in 20 experiments as a possible substitute. Chickens' small intestine is long and consistently sized. The circular muscles are three times thicker than the longitudinal muscle. Fresh chicken intestine was procured from a meat market that was duly registered with the local government. It was then promptly transported to the laboratory and stored in a flask along with 500 cc of "chick" solution. The components of the chick solution are NaCl 118.4 mm, KCl 4.6 mm, CaCl₂ 2.0 mm, MgCl₂ 0.5 mm, KH₂PO₄ 1.2 mm, NaHCO₃ 25 mm, glucose 11.1 mm, and sucrose 13.2 mm.

C. Purgative Activity Assay Procedure:-¹⁰

- Create three compartments in the small intestine by tying threads of varying colours together such that liquid cannot pass through them.
- Fill the first compartment with 0.2 ml of each hypotonic solution, the second compartment with 0.2 ml of hypertonic solution, and the third compartment with 0.2 ml of isotonic solution.
- Wait for 20 min and the observations are to be recorded.

D. Preliminary Phytochemical Screening:¹¹

Freshly prepared *Ficus hispida* leaves extract was subjected to different qualitative tests.

➤ **For Carbohydrates:**• **Mueller's Test:**

5 ml of distilled water was used to dissolve about 500 mg of crude extract, which was then filtered. To the filtrate, a small amount of Molisch's reagent (10% (w/v) in 90% ethanol) was applied. Next, a cautious 1 ml of concentrated H₂SO₄ was gently poured along the test tube's side. Five millilitres of distilled water were added after two minutes. A dark red colour formed at the inter phase between the two layers, confirming a positive test result indicating the presence of carbohydrates.

➤ **To Reduce Sugars:**• **Fehling's Test:**

Which involves dissolving 2 mg of plant extract in 1 ml of distilled water and filtering the mixture. After heating the filtrate for a few minutes in a water bath, 1 ml of Fehling's solutions A and B were added in a 1:1 ratio. The presence of reducing sugars was established by the formation of a brick-red precipitate.

➤ **Alkaloids Test:**• **Mayer's Test:**

2 ml (50 mg extract dissolved in 5 ml of 1% aqueous HCl) filtrate along the test tube was mixed with one or two drops of 0.35 mol/l Mayer's reagent (potassium mercuric iodide solution, 1.36 g mercuric chloride and 5 g of potassium iodide, dissolved in 100 ml distilled H₂O). A

white, creamy precipitate indicated a positive test, indicating the presence of alkaloids.

➤ **Tannin Test:**• **FeCl₃ Test:**

50 mg of plant extract was diluted in 5 ml of distilled water, and then a few drops of 5% FeCl₃ were added. The bluish-black colour that developed was evidence of tannin.

➤ **Flavonoid Test:**• **Alkali Test:**

This test exhibited a bright yellow colour when a few drops of 5% NaOH solution were added to 1 ml of filtered stock solution (100 mg of extract diluted in 10 ml of methanol). In the presence of diluted HCl and verified flavonoids, the colour disappeared.

➤ **Glycoside Test:**• **Keller-Killiani Test:**

One millilitre of the extract, one millilitre of glacial acetic acid, a few drops of 2% FeCl₃, and one millilitre of concentrated H₂SO₄ were added to the mixture for this screening. The presence of glycosides is indicated by the appearance of the Brown ring.

➤ **Examine Fat and Fixed Oil:**• **CuSO₄ Test:**

1 ml of 1% CuSO₄ was mixed with 5 drops of extract solution (0.25 g extract diluted in 25 ml mother solvent), and a few drops of 10% NaOH were added after that. The presence of fat and fixed oils is indicated by the appearance of clean blue solution.

Table 1 Phytochemical Screening

Sr. No	Component	Test	Inference
1	Carbohydrates	Molisch's Test	+++
2	Reducing Sugars	Fehling's Test	++
3	Alkaloids	Mayer's test	++
4	Tannins	FeCl ₃ test	+++
5	Flavonoids	Alkali test	+++
6	Glycosides	Keller-killiani Test	+++
7	Fat and Fixed Oils	CuSO ₄ Test	+

(++ Moderately Present, + Weakly Present, and +++ Strongly Present)

Phytochemical screening revealed the presence of carbohydrates, reducing sugars, alkaloids, tannins, flavonoids, glycosides, fat, and fixed oils in the methanolic extract of FH.

III. OBSERVATION AND RESULT

Table 2 Dose Response Relationship Observations of Methanolic Extract.

Drug	Compartment	Effect
Hypotonic Solution (0.2ml of 0.9% of NaCl)	One compartment	Shrunk
Hypertonic solution (0.2 ml of 27% Mgso ₄)	Second compartment	Swollen
Isotonic solution	Third compartment	No change

(0.2 ml of frog ringer sol.)		
Sample (0.2 ml of methanolic extract of Ficus Hispida)	Forth compartment	Swollen



Fig 2 Purgative Response Curves of Leaves Extract of FH.

IV. DISCUSSION

The current study's conclusions indicate that laxatives are used to treat constipation by promoting the evacuation of faeces. Laxatives function in multiple ways. The four main types of laxatives are saline purgatives, bulk laxatives, contact purgatives, and faecal softeners. The highly charged ions that make up saline purgatives are unable to readily cross biological membranes and remain within the lumen or route of the intestine. Because they retain water through osmotic forces, saline purgatives increase the volume of the bowel's contents. This causes the colon to expand and produces a common stimulus for the muscle to contract, leading to the passing of stool. A few often used salts are magnesium hydroxide, potassium sodium tartrate, sodium sulphate, and magnesium sulphate. Ficus Hispida fluid is moved from the callus into the lumen by methanolic extraction, which causes tissue swelling.

V. CONCLUSION

- The tissue contracts as a result of the osmosis process in a hypotonic solution forcing fluid out of the lumen and into circulation.
- When an isotonic solution was used and there was no fluid movement across the intestinal barrier, the result was tissue swelling due to the use of a hypertonic solution.
- By extracting the FH fluid methanologically and transferring the fluid from the callus in to the lumen tissue expansion results.

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