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A review on: Comparative studies on ethanolic extract of root and stem bark of *Ficus carica* for analgesic and anti-inflammatory activities

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Abstract

Medicinal herbs are highly highlighted due to their wider use and lesser side effects. Plant extracts have been used for centuries, as popular remedies against several health disorders. Therefore, development of newer and more potential drugs with lesser side-effects is necessary. This review gives a detail of the screening of medicinal plant (*Ficus carica*) used as traditional medicine found in traditional books. Different parts of the plants are used as laxatives, mild constipation. The milky latex from *Ficus carica* leaves and stems is reputed to be analgesic, and has long been used to treat warts, insect bites and stings. The present study is aimed to investigate the analgesic and anti-inflammatory activities of two parts (root and stem) of medicinal plant *Ficus carica* with corresponding comparison to available chemical drug (Indomethacin). The aim is to explore the most probable part of *Ficus carica* as an analgesic and anti-inflammatory activity to access the most suitably active natural based therapeutics used in pain and inflammation with relatively lesser side effects compare to easily available NSAIDs (Indomethacin). The present review is an effort to give a detailed survey of the literature on, anti-inflammatory and analgesic potential of stem bark and root of *Ficus carica.*

Key-Words: Analgesic, Inflammation, *Ficus carica*, Indomethacin

Introduction

Pain is a pathophysiological response of living tissue to undesirable stimuli. Pain can also be elicited by inflammation. Various types of pain such as**:** acute pain (defined as of < 3 months duration), neuropathic pain **(**follows damage to the nervous system), chronic pain **(**transmitted by slow conducting type C fibres), Transient pain (activation of nociceptors in skin or other tissues in the absence of tissue damage). Inflammation is characterized clinically by signs such as edema (swelling), tenderness and pain. Prostaglandins and histamine have been implicated in these inflammatory processes. Inflammatory responses occur in three distinct phases, each apparently mediated by different mechanism: An acute, transient phase characterized by local vasodilation and increased capillary permeability. A sub acute phase, characterized by infiltration of leukocytes and phagocytic cells. A chronic proliferative phase, in which tissue degeneration and fibrosis occur.

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Inflammation is a pathophysiological response of living tissues to injuries that leads to the local accumulation of plasmatic fluid and blood cells. Although it is a defense mechanism, the complex events and mediators involved in the inflammatory reaction can induce, maintain or aggravate many diseases.

Ficus carica commonly known as “Anjir” belongs to the family Moraceae. Different part of the *Ficus carica* such as Fruit, Latex, Bark, Roots, Leaves etc. have reported as a potential anti-inflammatory and analgesics. Fig contains around 50% fruits sugars, flavonoids, vitamins and enzymes. Ethanolic (70%) extraction of *Ficus carica* by soxhlet extraction contain these active phytoconstituents. Anti-inflammatory activity of Leaves of *Ficus carica* have evaluated (Patil *et al)* and the presence of flavonoids, polyphenols, forms the basis for supporting the analgesic and anti-inflammatory activity of other parts of *Ficus carica* too. Phytoconstituents which is responsible for showing the analgesic and anti-inflammatory activity are Flavanoid, Polyphenol, Glycoside, Triterpenoid, Steroid etc. Most of them are

present in the *Ficus carica* (root and stem bark), it gives us the orientation towards the selection of *Ficus carica* as potential analgesic and anti-inflammatory agent.

Phytochemical constituents

Ficus carica have therapeutic potential due to the presence of natural agents, Majority of their activity is due to bioactive compounds viz. flavones, isoflavones, flavonoids, alkaloids, tannin, saponins and triterpenoids, polyphenols etc. Study of the stem and root extract have give an idea about similar or different flavonoids and polyphenols compositions. The leaf of the *Ficus carica* contain higher anti-inflammatory activity in ethanolic extract due to the presence of Flavonoids phytoconstituents (Patil *et al* 2011).

Acute oral toxicity study

Acute oral toxicity assay was performed in healthy nulliparous and non-pregnant adult female albino mice (20-35g) and albino rats (230-300g) divided into different goups as per the OECD guidelines- 423. The control groups reveived 2% CMC suspension at the same volume. The sign of behavioural changes and mortality is observed.

Analgesic Activity

The analgesic potential of leaves of *Ficus carica* ethanolic extract is measured in terms of maximum possible effect (MPE). The ethanolic extract prepares from stem bark and root exhibit significantly higher analgesic activity when compares with the standard NSAIDs Indomethacin.

The peripheral and central analgesic activities of ethanolic extract of *Ficus carica* (stem bark and root) are evaluated in male or female mice using the acetic acid-induced writhing test and the hot-plate test, respectively.

In the writhing test, male mice are orally administered with test drug before 1 h of intraperitoneal injection of acetic acid (0.6%, 10 ml/kg). The number of writhing reflex was counted during the following 15 min. In the hot-plate test, Mice is screened by placing them on a hot plate maintained at 55±1.0ºc and the reaction time in seconds for hind paw licking or jumping is records. Mice is orally administerd the test drug (EFC stem bark and root 300, 600 mg/kg). Each mouse serves as its own control. Mice in each group is observed for 30, 60, 90 min after drug treatment (A.M. Bhandare *et al* 2010).

Anti-inflammatory activity

The anti-inflammatory activity of methanol extract of *Ficus carica* investigates using the following models:

Carrageenan induced paw edema

For the experiment, the male wistar rats (120–150 g, n = 6) selects. The animals are fasted overnight prior to the start of the experiment,and water ad libitum. Acute inflammation produced by the subplantar administration of 0.1 ml of 1% carrageenan (in 1% CMC w/v) in theright hind paw of the rats. The animals pretreated with the drug 1 h before the administration of carrageenan. The thickness (mm) of the paw measure immediately and at 30, 60, 120 and 240 min interval after the carrageenan injection,by using plethysmometer.

Cotton pellet-induced granuloma

For the experiment, the male wistar rats (120–150 g, n = 6) selects. The animals are fasted overnight prior to the start of the experiment, and water ad libitum. Cotton pellets, weighing 5 mg each, are sterilized. Under ether anesthesia, the pellets are introduced subcutaneously through a skin incision in the back of the animals. Control groups received the vehicle (distilled water, 10 ml/kg), while the reference group is treated with 10 mg/kg of Indomethacin. At the same time, test groups of rats are administered with 300 and 600 mg/kg of the ethanol extract of *Ficus carica* (stem bark and root). All the groups are treated orally for 5 days and started 30 min after cotton pellet implantation. On the fifth day, the animals are sacrificed with chloroform, the granulomas are removed, dried for 24 h at 60 _C and the dry weights determined. The difference between the initial and final dry weights was considered to be the weight of the amount of granulomatous tissue produced (J.M. joseph et al., 2010).

Conclusion

As we know that the herbal products are well thought-out to be symbols of safeguard in comparison to the synthetic product that are regarded as unsafe to human life and environment. But now everyday pharmacological studies are conducted on different parts of these plants. The present literature supports the possible of *Ficus carica* (stem bark and root) as a medicinal plant. More research can be done to explore the unknown and unexplored potential of *Ficus carica* plants. From this literature it may be concluded that the ethanolic extracts of stem bark and root of *Ficus carica* shows significant anti-inflammatory effects, similar to those observed for non-steroidal drug Indomethacin. It is important to point out that phytochemical analysis shows the presence of flavonoids and this might be responsible for anti-inflammatory activity.

Further investigations are under process in our laboratory to isolate as well as characterize the specific part (stem bark and root of *Ficus carica* as an analgesic and anti-inflammatory activity) and constituents of

plant extracts which is responsible for observed pharmacological actions.

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