PHARMACOLOGICAL ROLE OF FICUS RELIGIOSA A HIDDEN SACRED FIG PLANT: A SYSTEMATIC LITERATURE REVIEW

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Abstract

Objective: The aim of the study was to conduct a systematic literature review to investigate *Ficus religio*sa a traditional medicine used in the Management of several diseases.
Methods: On November 9, 2022, an electronic search of the literature was conducted in the databases PubMed database and Google Scholar, looking up all publications published in English. The review was not constrained by any factors (such as study design, geographic location, or time period).
Results: The starting data set search chose a sum of 1680 articles, 103 in PubMed, 1454 in Google Researcher, and 123 records from different sources. A sum of 1410 (complete copies viewed as 270) was tracked down in the wake of eliminating the copied articles, and subsequent to perusing the title and edited compositions the screen records 289 were additionally diminished to 38 articles with complete text. These 38 examinations selected the full-text investigation, which brought about the rejection of 13 investigations and produced a final 25 articles included for foundational investigation.
Conclusion: This study showed that *Ficus religiosa* has beneficial effects on health in several diseases due to its high phytochemical content. Therefore, *Ficus religiosa* has the potential to be used as a pharmaceutical product for health.

Keywords Pharmacology, Ficus religiosa, Sacred, fig, pipal, medicinal plant

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1. Introduction

About 750 distinct species belong to the enormously diverse genus Ficus (Sharma et al., 2016). The plant *Ficus religiosa* is a member of the Moraceae family and the genus Ficus. F. religiosa uses a small quantity of water and soil to sustain the growth of another tree or building before eventually suffocating the other plant's support system or destroying the structures. Although it is common in many parts of India and Burma, it is native to the sub-Himalayan range. The majority of South Asian nations are where it is most frequently seen (Krishnamurthy, 2016). Its scientific name is a combination of the Latin words Ficus, which means fig, and religiosa means religion.

According to Gautam et al., *F. religiosa* is known by a variety of vernacular names, including Pipala in Sanskrit, Ahant in Assamese, Ashud or Asvattha in Bengali, Piplo or Jari in Gujrati, Aralegida or Ashvatthanara in Kannada, Bad in Kashmiri, etc. (Gautam et al., 2014). *F. religiosa* is known by a number of various names across the world, including Putishu in China, Pepalbaum in Germany, Higuera de agua in Spain, and Fico del Diavolo in Italy (Kariyawasam, 1995).

F. religiosa is one of the primogenial plants in Indian texts and is also referred to as the peepal or sacred fig (Singh et al., 2015). Its existence may be seen back to the Indus Valley civilization, which flourished from 300 BC to 1700 BC and was responsible for the introduction of that era's money (Pandey and Pandey, 2016).

Homeopathy, Ayurveda, and Unani all reference the extensive medical usage of *Ficus religiosa* in the past. Since the beginning of Indian culture, the plant has been deeply rooted in both mythology and religion. The tree is mostly located in India close to holy sites. According to the Vedic index, the tree is also referred to as Asvattha, which means "horse stable" in Sanskrit. The third heaven and the tree are connected by the Atharvaveda. The Triad of Gods, Brahma, Vishnu, and Shiva are connected to the tree. According to Pokhareal & Pokhareal (2001), the Puranas, Upanishads, Bhagavad-Gita, Ramayana, and Mahabharata all mention the Asvattha tree as a sacred plant (Pokhareal and Pokhareal.,2001).

Due to the amalgams found in *Ficus religiosa*, which aid in treating a variety of illnesses including respiratory diseases, sexual diseases, skin infections, diabetes mellitus, cardiovascular disorders, and central nervous system diseases, it is receiving a lot of attention in the medical field (Mansoori et al., 2017). Ras Ayana in Ayurveda is a kind of *F. religiosa* that is used in a variety of ways. According to Govindaranjan et al. (2005), Ras Ayana medicines are used to rejuvenate, protect against free radical damage, and reduce stress in the body (Govindaranjal et al.,2005). *F. religiosa* is a widely used indigenous medical system that includes Unani, Ayurveda, Siddha, and Homoeopathy. *F. religiosa* is considered to play an important role in the treatment of diabetes and to be quite helpful in this regard according to the Ayurvedic medical system (Makhija et al., 2010).

The religious tree In India is sometimes referred to as sacred fig or peepal. *F. religiosa* may spread out from its trunk up to 5000 feet. The lifespan of *F. religiosa* ranges from 900 to 1500 years. For usage as an ornamental tree in parks and gardens, it is raised by specialist tree plant nurseries (Choudhary, 2006). The leaf of *Ficus religiosa* is heart-shaped. The epiphytic nature of its leaves is characteristic, and the withering branches have long petioles with oval, glossy leaves. The leaves are brilliant green in color and range in size from 10 to 17 cm in length, 8 to 12 cm in width, and 6 to 10 cm in the petiole. With a 3 m diameter, the trunk measures approximately 9.8 ft. According to Babu et al. (2010), the thickness of the tree's bark ranges from 5 mm to 8 mm, and it typically has a smooth surface or is just slightly curled. When the leaves are fully developed, they start out with a light reddish-pink hue before turning dark green (Panchawat., 2012).

According to Bhalerao and Sharma, the plant begins to blossom in February, the fruits begin (Bhalerao and Sharma., 2014) to bloom in the summer, and the fruits begin to mature just before the rainy season begins. The fruits grow in pairs and together they provide a distinct bulk. The immature fruits are green in color and grow into blackish purple (Dharmender et al., 2010).

In many regions of the world, different plant components, including the roots, stems, and leaves, are thought to provide therapeutic benefits for various maladies. The herb *F. religiosa* has long been used extensively by Indians and Nepalese people to cure a variety of wounds and illnesses (Manorenjitha et al., 2013).

According to Makhija et al, the plant's fruits include phytochemicals such as glycosides, flavonoids, and terpenoids (Makhija et al., 2010). Fully developed fruits may be consumed and are a good source of dietary fibers, proteins, vitamins, and minerals (Ruby et al., 2000). According to Bhalerao and Sharma, the leaves of *F. religiosa* contain terpenoids, flavonoids, tannins, and other phytochemicals that are helpful in treating conditions like gonorrhea, vomiting, and other issues (Bhalerao and Sharma., 2014).

According to Singh and Jaiswal, the bark of *F. religiosa* contains phytochemicals such as tannins, flavonoids, saponins, and more (Singh and Jaiswal., 2014) The saturated portion of the dried bark of *F. religiosa* contains phytochemicals such begaptol and bergapten as well as flavonoids,

tannins, and phytosterols. According to claims, the stem bark of *F. religiosa* contains alkaloids, phenols, tannins, steroids, flavonoids, vitamin K, n-octacosanol, sitosteryl-D-glucoside, methyl oleanate, lanosterol, lupen-3-one, and stigmasterol among other phytoconstituents.

According to Bhogaonkar et al, the fresh fruits of *F. religiosa* have a moisture content of roughly 62.4 g, 21.2 g of carbohydrates, 2.5 g of proteins, 1.7 g of lipids, 9.9 g of crude fibers, and around 289 mg of calcium per 100 g (Bhogaonkar et al., 2014)According to Verma and Gupta, the dried fruits of *F. religiosa* have an approximate moisture content of 18.8 g, 68.33 g of carbs, 8.48 g of proteins, 0.143 g of lipids, 69.43 g of dietary fiber, 848 mg of calcium, 6 mg of iron, and 4.44 g of ash per 100 g (Verma and Gupta., 2015). According to Wangkheirakpam and Laitonjam, the leaves of *F. religiosa* have a moisture content of 50.50 g, a composition of 19.20 g carbohydrates, 13.55 g proteins, 2.5 g fats, 26.1 g crude fiber, 12.9 g ash content, 1.79 mg calcium, 0.18 mg iron, 4.44 g ash content, 0.355 mg zinc, and 0.09 mg manganese per 100 g (Wangkheirakpam and Laitonjam., 2012). According to Singh et al., the bark of *F. religiosa* contains around 62.4 g of moisture, 15.20 g of carbs, 2.5 g of proteins, 1.7 g of lipids, 9.9 g of crude fiber, 13.1 g of ash content, 16.1 mg of calcium, 623 mg of iron, 13.1 g of ash content, and 0.09 mg of zinc per 100 g (Singh et al., 2015).

2. Methods

The systematic review was carried out and summarized as per the recommendations governed by the PRISMA reporting items, which are the ideal reporting items for meta-analyses and systematic examinations (Moher *et al.,* 2009).

2.1 Information Source and Search Method

To find pertinent research documenting the impact of *Ficus religiosa* on health, a thorough assessment of the literature was done. From October to November 2022, a digital literature review of all English-language articles was conducted. Regarding this, databases were looked up in addition to PubMed and Google Scholar (search criteria were not set). A combination of the keywords "*Ficus religiosa*" AND "Pharmacological effect" OR "health issues" OR "alternative medicine" or "Therapeutic use" were used in the search strategy.

2.2 Criteria for Inclusion and Exclusion

Inclusion

- The primary literature with a research focus on *Ficus religiosa* and its Pharmacological effect, health issues, alternative medicine, or Therapeutic application was included.
- Only studies that were written in English and published were included in the results.

Exclusion

- The evaluation did not include editorials, letters, or news.
- The research that had no bearing on *Ficus religiosa* was eliminated.

2.3 Selection of Articles

The original database search turned up 1680 articles in total, including 103 in PubMed, 1454 in Google Scholar, and 123 in other sources. After the duplicates, a total of 1410 articles were found (there were 270 total duplicates found), which was further reduced to 289 full-text articles following analyzing the titles and abstracts. According to the flowchart in Fig. 1, these 289 papers underwent full-text analysis, which resulted in the selection of 38 full-text articles and the removal of 251 articles. Further assessment leads to 25 articles included for systemic assessment and the removal of 13 studies.

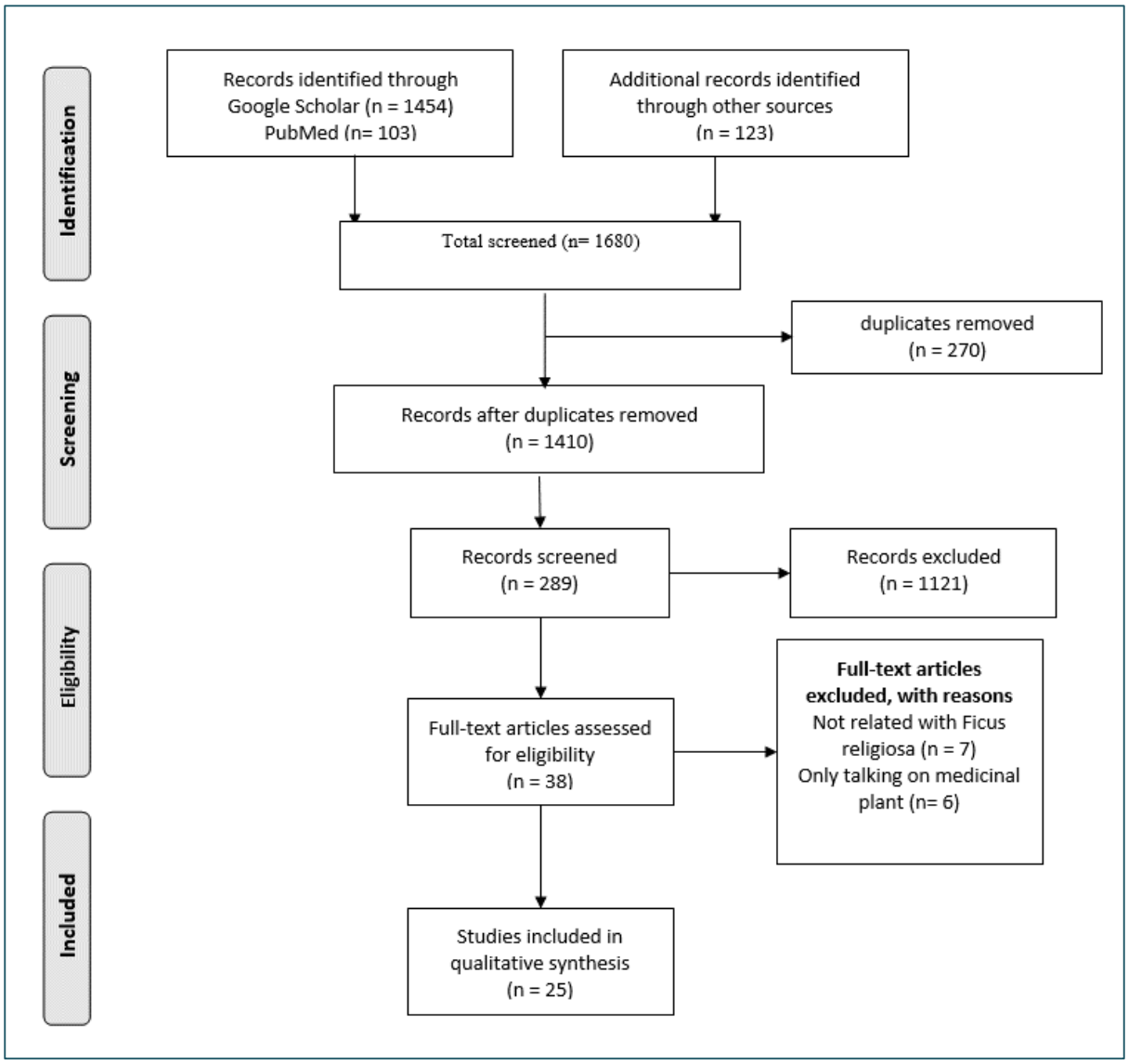

Fig. 1 PRISMA Flow chart outlines of relevant studies.

3.Result

All 25 articles included in the study has been listed as per the outcomes and findings were mentioned in Table 1.
Among those selected studies, Most of the studies found experimental animal models (Ghosh et al., 2016; Kaur et al., 2010; Cagno, et al., 2015; Ahuja et al., 2011; Patil et al., 2011; Singh & Goel, 2009; Kapoor et al., 2011; Singh, Singh, & Goel, 2011; Yadav & Srivastava, 2013; Raisagar et al., 2019; Choudhari, Suryavanshi, & Kaul-Ghanekar, 2013; Sankar et al., 2014; Pandit et al., 2010; Mousa et al., 1994; Gulecha and Sivakumar., 2011; Aqil and Ahmad.,2013; Hemaiswarya et al., 2009; Khan et al., 2011; Charde et al., 2010; Uma et al., 2009) One study on Experimental food products (Verma, & Gupta, 2015) and for study based on Review (Singh et al., 2016; Sahoo, 2012; Akhtar et al., 2000; Murugesu et al., 2021).

Articles found on genital ulcers and sores (Ghosh et al., 2016; Khan et al., 2011), anti-amnesic (Kaur et al., 2010), antiviral (Cagno, et al., 2015), bronchoconstriction (Ahuja et al., 2011), anti-convulsant (Patil et al., 2011; Singh & Goel, 2009; Singh, Singh, & Goel, 2011), anti-asthma (Kapoor et al., 2011), nephroprotective (Yadav & Srivastava, 2013), Wound healing and anti-inflammatory (Raisagar et al., 2019; Charde et al., 2010), cervical and anti-cancer (Choudhari, Suryavanshi, & Kaul-Ghanekar, 2013; Sankar et al., 2014; Gulecha and Sivakumar., 2011), antidiabetic (Pandit et al., 2010), Respiratory activity (Mousa et al., 1994), anti-bacterial and antifungal (Aqil and Ahmad.,2013; Hemaiswarya et al., 2009; Uma et al., 2009).

Many parts of the tree have been used traditionally, such as roots. Bark, stem, leaves, fruit, latex, etc. Three studies used bark (Ghosh et al., 2016; Cagno, et al., 2015; Raisagar et al., 2019; Choudhari et al., 2013; Pandit et al., 2010; Khan et al., 2011; Uma et al., 2009), leaves (Kapoor et al., 2011; Singh, Singh, & Goel, 2011; Sankar et al., 2014; Gulecha and Sivakumar., 2011; Aqil and Ahmad.,2013; Hemaiswarya et al., 2009; Charde et al., 2010), Fig (Kaur et al., 2010; Ahuja et al., 2011; Singh & Goel, 2009; Verma, & Gupta, 2015; Mousa et al., 1994), root (Patil et al., 2011) and latex (Yadav & Srivastava, 2013).

Most of the studies reported from India (Ghosh et al., 2016; Kaur et al., 2010; Cagno, et al., 2015; Ahuja et al., 2011; Patil et al., 2011; Singh & Goel, 2009; Kapoor et al., 2011; Singh, Singh, & Goel, 2011; Yadav & Srivastava, 2013; Raisagar et al., 2019; Choudhari, Suryavanshi, & Kaul-Ghanekar, 2013; Sankar et al., 2014; Pandit et al., 2010;; Gulecha and Sivakumar., 2011; Aqil and Ahmad.,2013; Hemaiswarya et al., 2009; Khan et al., 2011; Charde et al., 2010; Uma et al., 2009; Verma, & Gupta, 2015; Singh et al., 2016; Sahoo, 2012), Malaysia (Murugesu et al., 2021), Finland (Mousa et al., 1994), and Pakistan(Akhtar et al., 2000) are included in the paper.
To assess the quality of all 25 included studies based on the recommendation from these studies is illustrated in **Table 2,** which provides examples of evidence-based advice from the 25 research that was included to help evaluate the quality of the studies. The categories are (1) "Strong evidence" (Human or randomized clinical trial), (2) "Medium evidence" (observational studies or animal experimental model), and (3) "Weak evidence" (reviews) (Sharma, & Sharma, 2023).
Table 3 contains one more assessment of the quality of the selected articles on the basis of the JBI checklist for included studies. The assessment shows not a single study had confounding factors, so therefore not mentioning the strategies to deal with confounding factors as well as the rest of the seven studies could not measure an outcome in a valid and reliable way (Sharma, & Sharma, 2023).

4. DISCUSSION

4.1 Anti-Bacterial Activity

In contrast to *Salmonella Para typhi, S. typhimurium, Staphylococcus aureus, Shigella dysenteriae, P. aeruginosa, Escherichia coli, S. aureus, Bacillus subtillis,* and *S. typhi. sedimentary* and ethanolic extracts of *F. religiosa* shown antibacterial properties (Valsaraj et al., 1997). Different research found that fruit extracts preserved in chloroform had antibacterial effects on *Klebsiella pneumonia, Streptococcus faecalis, Bacillus cereus, Azobacter chroococcum, B. megaterium, and Bacillus cereus (Mousa et al., 1994).* An extensive continuum of antibacterial effectiveness with a zone of the reluctance of 10–21 mm was impacted by the Chloroform extracts of F. religiosa. In contrast to many bacterial strands, the methanolic extracts maintained mild anti-bacterial activity. Less or no antibacterial activities were retained in the aqueous extracts. The efficacy of the *F. religiosa* extracts against *Penicillium notatum* and *Aspergillus niger* has been demonstrated. In contrast to most microbes, the leaf extracts revealed significant and irregular repressive effects (Aqil and Ahmad, 2013). According to the testimony of Kumara and Sreedhar Murthy, *F. religiosa* leaves do not exhibit any anti-fungal activities in contrast to plant morbific fungi, but when they were combined with petroleum ether and methanol, they did exhibit significant and controlled anti-fungal activities in

contrast to *C. albicans* (Hemaiswarya et al., 2009).

4.2 Anti-Helminthic Activity

Haemonchus contortus worms were completely killed by methanolic excerpts of the *F. religiosa* bark (Kaushik et al., 1981). It has been proven that *Ascaridia inspida* is fatal to *F. religiosa* stem and bark samples. According to reports, *F. religiosa* is used to cure a variety of parasite illnesses in both humans and animals. According to the study, methanolic bark samples from *F. religiosa* had an anti-helminthic effect on mature Haemonchus contortus worms. The anti-helminthic effects in the methanolic excerpts of F. religiosa were proven to be caused by ficin (Akhtar et al., 2000). The concentrated forms of *F. religiosa* stem and bark are effective in eradicating Ascaridiagalli in an in vitro environment. In contrast to *Vampirolepis nana, Aspiculuristetraptera*, and *Syphaciaobvelata*, the latex of *F. religiosa* is believed to contain anti-helminthic activity (Hansson et al., 1986).

4.3 Anti-Ulcer activity

In accordance with Bansal et al., The condition known as a "peptic ulcer" is characterized by an uneven thickness of the gastrointestinal or duodenum mucosa, which persists as a result of an excess of pepsin and acid in the contents of the stomach. (Bansal et al., 2009). The majority of the side effects connected with publicly accessible anti-ulcer drugs pertain to the management of peptic ulcers. New anti-ulcerogenic medicines are therefore required. One of these plants, F. religiosa, has historically been used to heal stomach ulcers in several parts of Malaysian mythology and India (Ravishankar and Shukla, 2007; Kumar et al., 2011). In contrast to in vivo, indomethacin-involving cold-restrained stress-induced ulcerations of the stomach and pylorus ligation experiments, the anti-ulcerogenic activities of the bark of the stem of F. religiosa were examined using ethanol extracts (Khan et al., 2011).

4.4 Anticancer activity

In the potato disc bioassay, the *F. religiosa* fruit samples showed antineoplastic properties. According to all the validated excerpts, the rat hypothalamic cells GH4C1 were not noticeably inhibited in their ability to receive calcium (Mousa et al., 1994). The SiHa and HeLa cervical cancer cell lines (F. religiosa bark extracts) aqueous development was sped up. P53, p21, and a protein called pRb articulation are stimulated as part of the plan of action. As a result, The G1/S phase cell cycle development of SiHa was disregarded. The expression of the phosphorylated Rb (ppRb) protein decreased as a result. On the other hand, it was discovered that the excerpts caused HeLa cells to go into apoptosis by raising the within-cell Ca2+ level, which led to the loss of mitochondrial membrane potential. Additionally, it supported the expression of caspase-3 and supported the ejection of cytochrome-c (Chaudhari et al., 2013). According to Gulecha and Sivakumar, F. religiosa leaf extracts are effective at reducing the likelihood of breast cancer cells. Through a variety of enticing mechanisms, the excerpts triggered apoptosis in cells with breast cancer (MCF-7) (Gulecha and Sivakumar, 2011).

4.5 Antioxidant Activity

The antioxidant (DPPH), wound rehabilitation (laceration, expurgation, histological and dead space injury model), and anti-inflammatory properties (Carrageenan persuaded paw edema) properties of the ethanolic excerpts of the leaves of *F. religiosa* were assessed. The antioxidant activities are in the range of 6.34% to 13.35% in the validated excerpts of various impairments in an assortment of 200 g/ml to 1000 g/ml. There was a noticeable increase in the rate at which injuries healed, the strength of skin breaches, and the strength of granuloma breaches. When compared to the standard (Ibuprofen gel), the excerpts clearly demonstrate anti-inflammatory effects30. The anti-amnesic properties of the methanol concentrate of figs from *Ficus religiosa* (FRFE) as well as the scopolamine-induced anterograde and retrograde amnesia in mice were investigated. 10, 50, and 100 mg/kg, i.p. of the methanolic alleviators were administered together with 10 mg/kg, i.p. of scopolamine. When scopolamine-induced both anterograde and retrograde amnesia was alleviated with figs from the *Ficus religiosa* in methanol, memory was noticeably improved. Pretreatment with cyproheptadine essentially reversed the anti-amnesic effect (Kaur et al., 2010).

4.6 Anti-inflammatory Activities

The body's immediate response to germs, toxic agents like chemicals, or physical injuries that cause tissue and cell death is inflammation. The organism's attempt to get rid of the upsetting triggers and start the healing process is a defensive one (Singh et al., 2008). Cytokines and chemokines, PGs, platelet activating factors (PAF), NO, and histamine are only a few of the various intermediaries involved in the inflammation process. It has been suggested that Ficus religiosa may have relaxing and pain-relieving properties. The unification of PG is a hurdle since it has a fundamental impact on the system. It was discovered that the leaf excerpts of Ficus religiosa may have a soothing effect on paw edema caused by carrageenan. The restraint of serotonin (5HT), kinins, and PG's arrival at the receptor were thought to be the cause of the inhibitory activity. (Charde et al., 2010). Because the catalyst

cyclooxygenases (COX) cause the blend of PG to be hindered, the methanol concentration of the stem bark of Rodents' carrageenan-induced irritability is inhibited by *Ficus religiosa*. Further research confirmed Shreelakshmi et al. (2007)'s assertion that the tannin found in the bark has an anti-inflammatory effect. Furthermore, it has been shown that a methanolic concentrate of the Ficus religiosa stem bark inhibits bradykinin (BK) and 5-HT, preventing aggravation. In contrast to carrageenan-induced paw edema, mangiferin which has been separated from the medication has a soothing effect (Verma et al., 2010).

4.7 Anti-diabetic properties

The effects of *F. religiosa* bark aqueous extracts (FRAE) at concentrations of 25, 50, and 100 mg/kg on mice with normal glucose-stacked hyperglycemia and diabetes induced by streptozotocin (STZ) were studied. 50 and 100 mg/kg had a more defined influence than 25 mg/kg. The levels of blood fatty substances and total cholesterol significantly decreased, but there was a notable rise in body weight, serum insulin, and the quantity of glycogen stored in the muscles and liver of STZ-induced diabetic rats. Additionally, STZ-induced pancreatic lipid peroxidation in diabetic rats was significantly decreased by FRAE. (Pandit et al., 2010). When administered orally to abstaining rabbits at the prescribed dose of 25 mm/kg, a phytosterolin unavailable from the root bark of *F. religiosa* caused a severe drop in blood sugar levels that were, with intravenous injections of 5–7.5 mg/kg, a severe result was obtained after 2 hours, whereas equivalent to 81 percent of the tolbutamide average was reached after 4 hours. (Ambike et al., 1997).

4.8 Anti-convulsant Reaction

Pentylenetetrazol (PTZ), picrotoxin, and maximum electroshock (MES) were used in an experimental paradigm to cause convulsions, thorough research was conducted on the figs (fruit) of *F. religiosa* and revealed encouraging anticonvulsant potential. In the aforementioned animals, cyproheptadine was combined with a nonselective serotonin antagonist (4 mg/kg) to concentrate on the inversion of the protective effect of concentrate. Additionally thought about were the extreme poisonousness, toxicity to neurons, and strengthening of phenobarbitone prompted sleep by excerpts. Compared to figs from other species described in Ayurveda, this plant's figs have the highest concentration of serotonin (5-HT).

In addition, neurotransmission mediated by Serotonin is known to regulate a range of possibly caused seizures and has a role in maintaining seizure security in multiple animal models of epilepsy by regulating different GABAergic and glutamatergic capacities. Elite execution fluid chromatographic (HPLC) was used to calculate the amount of F. religiosa. The test was conducted at 277 nm with 5 m Hypersil GOLD C-18 RP particles serving as a fixed stage. While using an acetonitrile stream rate of 1 ml min-1 and a 25 mM phosphates support (pH 2.5) as a portable stage. It displayed an intake peak with a maintenance period of 12.563 min, which is the same maintenance period as that of a typical serotonin configuration. demonstrate that the concentrate contains serotonin after that. It displayed an intake peak with a maintenance period of 12.563 min, which is the same maintenance period as that of a typical serotonin configuration. demonstrate that the concentrate contains serotonin after that. In the MES model, the study revealed a significant portion-subordinate drop in the length of tonic rear appendage growth. The idleness of colonic spasms was repressed in the picrotoxin model study, and the action was compared to that of the diazepam-treated group at a dose of 100 mg/kg. The concentrate gave no indication that it would protect against PTZ-induced spasms at any point. In the two models (MES and picrotoxin), pretreatment with cyproheptadine demonstrated restraint of the remove's anticonvulsant effect. In addition, the concentrate demonstrated no mortality and no changes in behavior in the paradigm of extreme injury.

In this study, the rotarod test was used to determine neurotoxic effects such as ataxia, odd walking patterns, slowed or impaired reflexes, and muscular relaxation. All creatures were prepared to maintain harmony on a rotating pole for several minutes after the excerpts demonstrated no signs of neurotoxicity. The findings support and legitimize the use of *F. religiosa* in ethnomedical therapies for epilepsy, and the high serotonin content of its figs led to the hypothesis that these figs may have anticonvulsant impacts by modulating serotonin levels in the brain, which will be useful in clinical settings (Singh and Goel, 2009).

4.9 Anti-Microbial Activity

Ficus religiosa is a plant that has been proven to be utilized as a national remedy for a number of communicable diseases. Hemaiswarya et al. examined that *Ficus religiosa* has antimicrobial properties. This article asserts that the plant's anti-microbial properties were enhanced by the chloroform extracts of the leaves of *F. religiosa*, which prevented the growth of many microbes, including *Salmonella species*, and *P. vulgaris, E. coli, Bacillus subtilis,* and *K. pneumonia*. potential known (Hemaiswarya et al., 2009). According to an alternate investigation, modified extracts (methanol, aqueous chloroform) of the F. religiosa bark had a suppressive effect on the growth of three

enterotoxigenic *E. coli*, shielding them from the diarrhea patients (Uma et al., 2009).

4.10 Wound healing activity

The effects of hydroalcoholic concentrate of *F. religiosa* leaves on rodents with potentially activated wounds using various damage models results in portion-subordinate wound healing action in extraction wounds, entrance point wounds, and devour wounds. A formulation of leaf extracts was created in emulsifying balm at a concentration of 5% and 10% additionally, applied to the wounds. The concentration demonstrated a significant reduction in the period of epithelization and in damage compression (by fifty percent) in the extraction wound and consume wound models. When compared to the control, a cut injury model showed a crucial increase in breaking strength. According to the findings, topically applied leaf concentrate of *F. religiosa* (5 percent and ten percent) has a portion-subordinate wound rehabilitation movement (Naira et al., 2009).

4.11 Anti-amnesic activity

Methanol concentrate made from *F. religiosa* figs was used to study the counter-amnesic effects of the plant. A key role in the etiology of forgetfulness is played by figs' high serotonergic content and balanced serotonergic neurotransmission. Using a methanolic concentrate of figs from *F. religiosa*, anterograde and retrograde amnesia caused by scopolamine in mice, was studied. The results demonstrated a dose-dependent anti-amnesic effect against scopolamine-induced amnesia (Kaur et al., 2010).

According to a different review, it was determined that the ethanol concentration of *Ficus religiosa* leaves has memory-improving effects. Sterols, glycosides, tannins, and amino acids were discovered in the leaf concentrate of *F. religiosa* using basic phytochemical screening and TLC analysis. The memory-improving effect was evaluated in comparison to the Hebb-William, Step through evasion, Sodium nitrite intoxication, and Spiral arm labyrinth test models. Additionally, to sodium nitrite intoxication, scopolamine was used as an actuating agent; in this model, sodium nitrite served as the prompting agent.

The concentrate demonstrated memory work and shifted between sodium nitrite- and scopolamine-induced hypoxia and amnesia. The effects of *F. religiosa* ethanol concentrate (100 mg/kg) were comparable to those of piracetam and mentat (100 mg/kg). The conclusion suggested that amino acids found in the concentrate may be responsible for the plant's anamnesis and memory-enhancing actions (Devi et al., 2011).

4.12 Anti analgesic activity

The acidic corrosive induced squirming (augmentation of hind paw) experiment in mice is used by Sreelekshmi et al. to study the analgesic efficacy of the stem bark of *F. religiosa*. The amount of wriggling decreased by 71.56 and 65.93%, respectively, at portions of 250 mg/kg and 500 mg/kg body weight. Therefore, it is reasonable to assume that concentration showed the pain-relieving effect by primarily inhibiting the production or activity of prostaglandins. (Sreelekshmi et al., 2007).

4.13 Hypolipidemic activity

The three main substances in peepal were cellulose, lignin, and dietary fiber (peepalbanti). As rats are fed, they have greater resilience to hyperlipidemia than cellulose at a 10% dietary level. The connection between dietary hemicellulose and excretory bile acids was better than that between dietary hemicellulose and blood and liver cholesterol. The liver's lipids, including phospholipids, and blood cholesterol, along with all other kinds of lipids, fluctuated as a result of the dietary fiber. To treat hyperlipidemia linked to diabetes mellitus, *F. religiosa* stembark is employed (Agarwal and Chauhan, 1988).

4.14 Anti-asthmatic reaction

Bronchial Asthma is another condition for which Ficus religiosa is used as a therapy. The first researchers to investigate the anti-asthmatic properties of the alcohol-based *Ficus religiosa* bark concentrate were Malhotra et al, they reported that the extract inhibited experimental asthma produced by acetylcholine and its receptor (Malhotra et al., 1960).

4.15 Proteolytic reaction

The electrophoretic and chromatographic characteristics of the protein components were used to complete a link between the enzymatic activity of the latex from 46 different species of Ficus religiosa. Huge proteolytic activity was demonstrated by *F. religiosa* (William et al., 1968).

4.16 Immune-modulating behavior

The immune-suppressive impact of fermented concentrate of the twigs of *F. religiosa* was studied by different hematological and serological testing in mice. Organization of concentrate strikingly enhanced both cell and humoral counteracting agent reactions. The fact that the concentrate had makes it assumed promising insusceptible energizer properties (Mallurwar and Pathak., 2008).

F. religiosa emerged as a respectable source of conventional drugs used to treat conditions including diabetes, stomach disorders, epilepsy, inflammatory problems, infectious problems, and

sexual problems. Although a large portion of the trial concentrates used unidentified rough concentrates, they were approved for their typical restorative purposes. As a result, it is challenging to confirm the findings and pinpoint the bioactive metabolite. Thus, there is a need for bioactivity-directed distinguishing proof of bioactive metabolites as well as phytochemical normalization. A detailed examination is required in light of the findings of quite a few pharmacological investigations and the bioactive metabolites that have previously been found in the F. religiosa plant's actual ability to fight off parasitic contaminations, malignant growth, cardiovascular problems, neuroinflammatory disorders, and neuropsychiatric issues. The findings of these studies will also increase *F. religiosa* existing capacity for assistance and provide convincing support for its potential therapeutic application in contemporary medicine.

5. Research consequences for the future

Further research could help with characterizing the base powerful portion of *Ficus religiosa* expected for beneficial impacts, the base compelling length of usage or supplementation, as well as the best readiness of concentrate for maximal beneficial impact. This will help with making decisions about the guaranteed benefits of *Ficus religiosa* on advanced well-being. But taking into account that there is some evidence for a positive impact of Ficus religiosa on health.

Uncertainty surrounds the in vivo study's effect. If fig has been shown to be good for bones, more study is needed to make Ficus religiosa both a preventative measure and a treatment for diseases of the bones. But first, it was important to properly evaluate the detrimental impacts of removing the figs.

6. CONCLUSION

This study demonstrated that Ficus religiose's high phytochemical content has positive impacts on health in a number of disorders. As a result, Ficus religiosa may one day be utilized to make pharmaceuticals for use in treating illnesses.

ABBREVIATIONS

HSV- *Herpes Simplex Virus*
TL – *Transfer latency*
EPM – *Elevated plus maze*
MPA – *Modified passive avoidance*
SDL – *Step down latency*
Ach – *Acetylcholine*
FR – *Ficus religiosa*
TP – *Tephrosia purpurea*
PAF – *Platelet-activating factor*
PTZ – *Pentylenetetrazol*
MES – *Maximal electroshock*
STZ – *Streptozotocin*

Declarations

• Funding
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• Conflicts of interest/Competing interests
Declared none
• Ethics approval
Does not required in a literature review.
• Consent to participate
Does not required in a literature review.
• Consent for publication
N/A
• Availability of data and material (data transparency)
For the literature review, all selected articles are available in an open system.

• Code availability (software application or custom code)
N/A
• Authors' contributions
All authors wrote, read, and approved the study for publication.

LS, JM, and DS: conceived the design, analysis and planning, review, and writing.
LS: writing, critical analysis, review, and supervision.
All authors provided their critical feedback and approved the final manuscript.

Table 1: The characteristics of included articles

Sl. No.	Author (Publication year)	Title	Country	Study Design/ Analysis	Description	Outcomes	Finding
1.	Ghosh et al., (2016).	Herpes simplex virus type 2 infection is prevented in vitro by preparations of the bark of *Ficus religiosa.*	India	Experimental	The goal of the study was to determine whether *F. religiosa* extracts had any antiviral properties against Herpes Simplex Virus type 2, which is the primary cause of genital sores and ulcers. The most active bark extracts were those in water and chloroform, with selectivity indices of 156.8 and 132.9, respectively. They were also effective against an HSV-2 strain that was resistant to acyclovir, which indicates that their mode of action may differ from that of the reference medication.	The chloroform bark extract, in contrast to the water bark extract, inhibited many phases of the viral replication cycle, including virus attachment and entrance into cells and the propagation of the virus from cell to cell.	The study supports the plant's traditional usage for treating genital ulcers and sores by demonstrating that F. religiosa bark extracts have inhibitory effects on HSV-2.
2.	Kaur et al., (2010).	*Ficus religiosa* has an anti-amnesic effect on scopolamine-induced anterograde and retrograde amnesia.	India	Experiment	The Adapted Passive Aversion Paradigm (MPA) with Elevated Plus Maze (EPM), as behavioral models for memory evaluation, used transfer latency (TL) to the favored niche and, respectively, learning to avoid passive behavior to avoid punishment. For all animals, scopolamine (1 mg/kg, i.p.) was administered before to training to cause anterograde amnesia and prior to retrieval to cause retrograde amnesia. Evaluations were done on the MPA's step downward latency (SDL), the TL in the EPM, the number of trials, and the number of errors. FRFE treatment groups (Piracetam 200 mg/kg, i.p.) and control groups (10, 50, and 100 milligrams per kilogram, i.p.) in the vehicle control. Identifying any possible involvement of serotonergic pathways, A not selective, 5-HT1/2 blocker known as cyproheptadine (4 mg/kg, intraperitoneal) was used in	The dose-dependent attenuation of the scopolamine-induced anterograde and retrograde amnesia by FRFE led to a considerable improvement in memory. Additionally, FRFE's anti-amnesic effect was significantly reversed by cyproheptadine pretreatment.	FRFE possesses dose-dependent anti-amnesic efficacy against scopolamine-induced amnesia. Cyproheptadine's ability to block FRFE's anti-amnesic action provides evidence that serotonergic pathways are involved in its function.

					conjunction with FRFE to increase its anti-amnesic effects.		
3.	Cagno, et al., (2015).	In vitro, human rhinovirus and respiratory syncytial virus infection is prevented by extracts from the bark of *Ficus religiosa*.	India	Experiment	Plaque diminution assays and virus production assays were used to measure F. religiosa L.'s antiviral activity, while virus disintegration and time-of-addition assays were utilized to measure virus inactivation. were used to study the main mechanism of action.	With an EC50 of 5.52 g/mL, the methanolic bark extract of F. religiosa L. was the most effective against HRV. The late stages of the replicative cycle were most likely suppressed by this extract. The most effective water bark extract against RSV has an EC50 ranging from 2.23 to 4.37 g/ml. Both interferences with virus attachment and partial virus inactivation were discovered to support anti-RSV action. In the viral yield reduction assay, both viruses were prevented from replicating.	According to the findings of the current investigation, F. religiosa L. possesses in vitro antiviral activity against RSV and HRV. Identification of the active ingredients and evaluation of the in vivo therapeutic potential still require more effort.
4.	Singh et al., (2016).	Review of the significant medicinal herb *Ficus religiosa* .	---	Review	The Ficus religiosa Linn., an enormous evergreen tree with leathery, heart-shaped, long-tipped leaves, may be found both in the wild and in cultivation across India. In India, it is a holy plant.	As one of the most adaptable plants with a wide range of medicinal properties, it is utilized for the ailment of a number of afflictions, including "diarrhea, diabetes, urinary tract problems, burns, hemorrhoids, gastrohelcosis, skin conditions, convulsions, tuberculosis, fever, paralysis, oxidative stress, and bacterial infections."	This is a special source of different kinds of substances with varied chemical structures (phenolics, sterols, etc.). We shall cover the information about peepal in this post.
5.	Sahoo, (2012).	Effectiveness of *Ficus religiosa* L. and *Ficus benghalensis* L. plant as antibacterial and antioxidant agents	----	Review	Ficus religiosa and Ficus bengalensis, two locally accessible plants, were chosen for the study because they have been used for many years to treat illnesses in a traditional manner. To standardize the extraction of antibacterial activity, many techniques are tested.	Reduced efficiency and 1,1-Diphenyl-2-picrylhydrazyl (DPPH) elimination of radicals were two in vitro antioxidant activities that were performed. When the absorbance at 517 nm decreases during DPPH activity, the plants' sample's scavenging activity increases, and the color of the plants' sample is decolored as a result of the presence of antioxidants.	A possible source of drugs used to treat inflammation and speed up the healing of wounds characteristics, Ficus religiosa leaf extracts have been experimentally demonstrated to exhibit remarkable antioxidative effects.

6.	Ahuja et al., (2011).	Ficus religiosa fruit methanolic extract has a potentiating impact on bronchospasm in guinea pigs.	India	Experimental	The guinea pig tracheal chain and ileum preparation in vitro and in vivo investigations of histamine-induced bronchospasm	The onset of the condition was markedly delayed by ketotifen (1 mg/kg, p.o.) pre-treatment. Histamine aerosol produced pre-convulsive dyspnea in guinea pigs as compared to vehicle control (281.8a 11.7 vs. 112.2 9.8). Methanol-based extracts (125, 250, and 500 mg/kg, p.o.) did not appear to have any noticeable impact on the pre-convulsive dyspnea onset latency caused by histamine. The methanolic extract of the fruits, however, significantly raised the EC50 estimates of both histamine and acetylcholine in the segregated guinea pig bronchial chain and ileum preparation at the quantities utilized (i.e., 0.5, 1, and 2 mg/ml). Serotonin was also present in the methanolic extract in high concentrations (2.89%, w/w), according to HPLC analysis.	Ficus religiosa fruits have been proven to have no effect on guinea pigs' histamine-induced bronchospasm, according to the data. Additionally, it has been demonstrated that the fruits' methanolic extract can enhance the bronchoconstriction brought on by acetylcholine and histamine in guinea pig tracheal chain preparation.
7.	Patil et al., (2011).	Aqueous Ficus religiosa root extract has anticonvulsant properties.	India	Experimental	The extract's ability to prevent seizures in mice produced by strychnine, pentylenetetrazole, picrotoxin, and isoniazid was examined at doses of 25, 50, and 100 mg/kg, orally. To investigate how the extract affected serotonin (5-HT) and acetylcholine (Ach)-induced contractions in the rat ileum and fundus strip preparations, respectively.	In the strychnine and pentylenetetrazol tests, the excerpts demonstrated no toxicity and dose-dependently shielded the animals. However, it had a less significant effect on the tests for picrotoxin and isoniazid. Additionally, the extract enhanced Ach in the rat ileum in a dose-dependent manner but failed to enhance the effects of 5-HT during the preparation of the rat fundus. strips.	The findings imply that a dose-dependent and powerful anticonvulsant action against strychnine and pentylenetetrazole-induced seizures may be found in an oral aqueous excerpt of the root of Ficus religiosa. Zinc and are readily apparent magnesium levels in the extract can be blamed for the reported actions.
8.	Singh & Goel, (2009).	Ficus religiosa's anticonvulsant effect: the contribution of serotonergic	India	Experimental	Maximum electroshock (MES), picrotoxin, and pentylenetetrazol (PTZ)-induced seizures were tested in order to determine the anticonvulsant activity of fig extract (25, 50, and 100 mg/kg, i.p.). The reversal	In addition to potentiating pentobarbitone-induced sleep and inhibiting seizures brought on by MES and picrotoxin in a dose-dependent manner, the extract showed	According to these results, the methanolic extract of figs from Ficus religiosa demonstrated dose-dependent anticonvulsant effectiveness against MES and

		pathways.			of the protective effect of the extract in the aforementioned mice was investigated using the nonselective (5HT1/2) serotonin antagonist cyproheptadine (4 mg/kg, i.p.). The effects of the extract on acute toxicity, neurotoxicity, and potentiation of pentobarbitone-induced sleep were also investigated.	no toxicity. The extract's anticonvulsant properties were comparable to those of clinically prescribed antiepileptic medications like phenytoin and diazepam. Seizures brought on by PTZ were not, however, prevented. The anticonvulsant action of the extract was inhibited in animals that had previously received cyproheptadine.	picrotoxin-caused convulsions without having any neurotoxic effects. It is confirmed that serotonergic pathways are involved in the anticonvulsant action of the extract by the inhibition of that effect by the serotonergic inhibitor cyproheptadine.
9.	Kapoor et al., (2011).	Ficus religiosa leaves were examined phytopharmacologically for their anti-asthmatic properties.	India	Experimental	F. religiosa fresh leaves were collected from Vastrapur Lake in Ahmedabad and dried to produce a powder. Acetylcholine and histamine were administered to guinea pigs to create a bronchospasm model. Aqueous extract of F. religiosa leaves (AEFR) was administered to guinea pigs in an in vivo investigation, and its bronchoprotective efficacy was contrasted with aminophylline at a concentration of 25 mg/kg. In an in vitro investigation, guinea pigs received doses of 10 g/mL, 20 g/mL, and 30 g/mL of AEFRL, respectively, and the mast cell stabilizing activity of AEFR was compared with ketotifen at 10 g/mL.	When compared to the vehicle control in the in-vivo model, pre-treatment with aminophylline (25 mg/kg, ip) could significantly postpone the onset of histamine-induced pre-convulsive dyspnea. AEFRL (150 and 300 mg/kg, ip.) administration also had a substantial impact on the latency to develop pre-convulsive dyspnea brought on by histamine and acetylcholine. AEFRL at 10, 20, and 30 g/mL could considerably enhance the number of undamaged cells in the mast cell stabilizing model.	It is clear that AEFRL works to treat guinea pigs with bronchospasm brought on by histamine and acetylcholine. Moreover, the mast cell stabilizing model's AEFRL can increase the proportion of intact cells.
10.	Singh, Singh, & Goel, (2011).	Hydroethanolic leaf extract of Ficus religiosa lacks anticonvulsant activity in acute electro and chemo convulsion mice models.	India	Experimental	When administered intraperitoneally (i.p.) at dosages of 100, 250, 500, and 600 mg/kg in the maximum electroshock (MES) test on mice, as well as at doses of 100, 250, 500, and 600 mg/kg in the pentylenetetrazol (PTZ) test, the hydroethanolic leaf extract of F. religiosa was examined for its anticonvulsant properties. In the MES and PTZ tests, it was noted the length of any tonic hind limb extension(s) and the delay to clonic convulsions (min). The reference standards for the MES and PTZ tests were phenytoin (25 mg/kg; i.p.) and diazepam (5 mg/kg; i.p.). Also noted was the mortality percentage.	When compared to their respective controls, there was no discernible difference in the duration of tonic hind limb extension in the MES test or the latency to clonic convulsions in the PTZ test following the extract treatment. Furthermore, the extract treatment had no effect on the percentage of mortality.	According to the findings of the current investigation, MES- and PTZ-induced convulsion tests performed using hydroethanolic leaf extract of F. religiosa did not demonstrate any anticonvulsant effect. To corroborate these conclusions, more research from other areas and utilizing various animal models are needed.

11.	Yadav & Srivastava, (2013).	Effects of *Ficus religiosa* latex extract on nephroprotection and treatment of cisplatin-induced acute renal failure	India	Experimental	By using a maceration procedure, methanol extract was produced. There were five groups of rats. Group 1 received 5 ml/kg of acacia (2% w/v) throughout the experiment, while Group 2 received a single dose of cisplatin (5 mg/kg i.p.) on Day 1, Group 3 received 200 mg/kg of extract orally from Days 1 through 10, Group 4 received 200 mg/kg of extract orally from Days 1 through 10, and Group 5 received 200 mg/kg of extract orally from Days 7 through 16, while Group 6 received the same dose.	The extract's glycoside, alkaloids, tannins (phenolic chemicals), flavonoids, and amino acids were all detected during a phytochemical analysis. The extract had half maximum inhibitory concentrations (IC50) of 31.75 0.12 and 18.35 0.48 mg/ml, respectively. The renal functions, biochemical parameters, and histology of the cisplatin-treated group 2 were considerably (**p50.01) restored by the 200 mg/kg curative and protective groups.	These results showed that the latex and constituents of F. religiosa have excellent nephroprotective and curative properties, which makes them a highly promising source for natural health products. .
12.	Verma, & Gupta, (2015)	Estimation of the figs' (*Ficus religiosa*) dried fruit's phytochemical, nutritional, antioxidant, and antibacterial activities, and creation of a value-added product (Hard Candy).	India	Experimental	The phytochemical study of sacred figs revealed the presence of total phenolics, flavonoids, and other secondary metabolites that support the fruit's strong antioxidant activity, as measured by the FRAP and DPPH scavenging assays, but the alkaloid content was relatively low.	The dried fruit of the sacred fig was nutritionally profiled, and it was shown to be an excellent source of dietary fiber, proteins, carbs, calcium, magnesium, phosphorus, and a comparatively insignificant quantity of fat. According to this study, Ficus religiosa figs can be used as a nutraceutical food with exceptional medicinal potential due to their high phytochemical and nutritional content.	In addition, hard-boiled candies were made using glucose syrup, lemon juice, dried powdered fruits of Ficus religiosa, and approved flavoring and coloring ingredients for aesthetic appeal. The panelists' overall acceptance was quite high according to the sensory evaluation.
13.	Raisagar et al., (2019).	Comparative analysis of the wound-healing properties of Ficus religiosa and Ficus benghalensis bark extracts in a mouse model.	India	Experimental	The phytochemical compositions of the plants, including the amounts of total phenols, flavonoids, terpenoids, and proteins, were studied using the plant extracts. The ethanol extract contains the majority of the phytochemicals that are physiologically active. The findings showed that the bark of Ficus religiosa had a stronger capacity for wound healing than the bark of Ficus benghalensis.	In vitro and in vivo wound models infected were used to examine the antibacterial activity, and well diffusion was used to assess the effect on wound healing in rats. The ethanolic extract of Ficus religiosa showed greater antibacterial action in terms of microbial resistance. Ficus religiosa and Ficus benghalensis bark extracts in ethanolic and hydroalcoholic form were tested for their ability to promote wound healing in vitro. It was carried out to inhibit RBC hemolysis and other	. It was discovered that two plants, Ficus religiosa, and Ficus benghalensis, have remarkable wound-healing activity when extracted with ethanol and hydroalcoholic solutions.

						wound-healing processes in vitro. The RBC membrane stabilization activity of the plant sample rises when there is an inhibition of RBC hemolysis due to a reduction in absorbance at 517 nm.	
14.	Choudhari et al., (2013).	Apoptosis is induced by *Ficus religiosa* aqueous extract in HeLa (HPV-18 positive) and SiHa (HPV-16 positive) human cervical cancer cell lines.	India	Experimental	the ability of an aqueous extract from the bark of F. religiosa (FRaq) to inhibit the growth of human cervical cancer cell lines SiHa and HeLa. In a dose-dependent way, FRaq changed the growth kinetics of SiHa (HPV-16 positive) and HeLa (HPV-18 positive) cells.	It prevented SiHa cells from progressing through the G1/S phase of the cell cycle, which is characterized by an increase in the production of the proteins p53, p21, and pRb and a concurrent decrease in the expression of the protein phospho Rb (ppRb). Contrarily, FRaq caused apoptosis in HeLa cells by raising intracellular Ca2+ levels, which resulted in the loss of mitochondrial membrane potential, the release of cytochrome-c, and an increase in the production of caspase-3. Additionally, Her-2 and MMP-2 expression were downregulated by FRaq, which also decreased the ability of both cervical cancer cell lines to migrate and invade.	All of these findings imply that F. religiosa might be researched for its potential to prevent cervical cancer with chemotherapy.
15.	Murugesu et al., (2021).	Ficus religiosa and Ficus benghalensis phytochemistry, pharmacological characteristics, and current applications	Malaysia	Review	The purpose of this review was to provide an overview of the pharmacological effects, phytochemistry, and medical applications of two important species from this genus, namely Ficus benghalensis and Ficus religiosa.	The observed Ficus species possess a wide range of biological properties, including antioxidants, antidiabetic, anti-inflammatory, anticancer, antitumor and antiproliferative, hepatoprotective, antimicrobial, anti-helminthic, wound healing, anticoagulant, immunomodulatory activities, antistress, toxicity studies, and mosquitocidal effects, according to existing studies on the pharmacological functions.	The review examines the recently identified therapeutic potentials and points out the study gaps for future research.
16.	Sankar et al., (2014).	Anticancer activity of Ficus religiosa	India	Experimental	This article describes an environmentally benign method for producing copper oxide nanoparticles quickly, using Ficus religiosa	The UV-vis spectrophotometer, with absorbance peaks at 285 nm, indicated the presence of the	The copper nanoparticles may have anticancer properties based on their observed

		engineered copper oxide nanoparticles			leaf excerpt as a reducing and protective agent.	synthesized copper oxide nanoparticles. With the help of a field emission scanning electron microscope (FE-SEM), Fourier transforms infrared (FT-IR) spectroscopy, dynamic light scattering (DLS), and X-ray diffraction (XRD) spectrum, the copper oxide nanoparticles were examined. Copper oxide nanoparticles are spherical in shape and have an average particle size of 577 nm, according to the FE-SEM and DLS investigations. The presence of biomolecules necessary for the reduction of copper oxide ions is made clear by FT-IR spectral analysis.	properties and the outcomes of our in vitro experiments.
17.	Pandit et al., 2o1o	Rats with diabetes caused by streptozotocin respond favorably to an extract of Ficus religiosa.	India	Experimental	In order to evaluate the hypoglycemic implications of FRAE in normal, glucose-loaded hyperglycemic, and diabetic rats induced with streptozotocin, this study was carried out. At 3 hours, FRAE showed a dose-dependent hypoglycemic effect in rats with normoglycemia. The results of the OGTT allowed for the conclusion that a dose of 50 mg/kg resulted in the greatest improvement in glucose tolerance. Significant hyperglycemia and hypoinsulinemia were caused by STZ. Blood glucose significantly dropped after taking FRAE orally for 21 days.	All of the models had their blood glucose levels significantly reduced by the three treatments. In comparison to 25 mg/kg, the effect was stronger at 50 and 100 mg/kg. The levels of blood triglyceride and total cholesterol were significantly lower in the STZ-induced diabetic rats, whereas FRAE also showed a considerable rise in serum insulin, body weight, and the amount of glycogen in the liver and skeletal muscle. The pancreas of diabetic rats generated by STZ also showed a substantial anti-lipid peroxidative impact via FRAE. A well-known hypoglycemic medication called glibenclamide was compared to Ficus religiosa antidiabetic efficacy.	The findings show that the bark of Ficus religiosa has strong anti-diabetic efficacy in an aqueous extract. Based on the results of this study, we can say that aqueous Ficus religiosa bark extract lowers blood sugar levels. In the case of diabetes, it could have therapeutic effects.
18.	Mousa et al., 1994	A few Egyptian Ficus species	Finland	Experimental	Bioactivity was tested in fruit extracts from *Ficus sycomorus L.*, *Ficus benjamina L.*,	Significant antibacterial activity, but no antifungal activity, was present in	The findings of this exploratory study are consistent with the

		have bioactive compounds.			*Ficus bengalensis L.*, and *Ficus religiosa L*. In contrast to *F. sycomorus* and *F. benjamina*, which exhibited no activity, *F. benghalensis* and *F. religiosa* showed action in the brine prawn test (Artemia salina), indicating toxicity. The potato disc bioassay revealed that every fruit extract has anticancer properties. The rat pituitary cells GH4C1 were not significantly inhibited by any of the studied extracts in their calcium absorption.	the extracts of the four Ficus species studied.	long-standing usage of these herbs in traditional folk medicine to treat certain skin conditions and respiratory ailments.
19.	Gulecha and Sivakumar., 2011	Use of MCF 7 cell lines to study the anticancer properties of Tephrosia purpurea and Ficus religiosa	India	Experimental	To examine the anticancer properties of various fractions of Tephrosia purpurea (TP) and Ficus religiosa (FR) plants. The effectiveness of distinct fractions of the MCF-7 human breast cancer cell line and Ficus religiosa, known as FR I and FR III, in reducing the number of viable tumor cells was examined in this study. According to the suggested study, the fractions from both plants were successful in reducing the number of viable tree cells, with viable tumor content typically declining at a concentration of 200 g/mL and in a dose-dependent manner. In contrast to the other two fractions, the concentration at the conclusion of each fraction was less effective. The research also contained flavonoids, which have been demonstrated to have an anti-malignant effect on signal transduction in cell proliferation and angiogenesis and are rich in flavonoid content. FR fraction treatment exhibited cytotoxic activity.	In this work, the MCF 7 cell line was used to demonstrate the anticancer potential of the TP and FR fractions. Comparatively speaking, the anticancer activity of the TPI, TPIII, FRI, and FRIII fractions was higher. It was discovered that the IC50 for TPI (152.4 M), TPIII (158.71 M), FRI (160.3 M), and FRIII (222.7 M) were all within the normal range.	The findings indicated that, among all these TPI fractions, TPIII, FRI, and FRIII showed superior anticancer activity in comparison to other fractions. The IC50 values for TPI (152.4 M), TPIII (158.71 M), FRI (160.3 M), and FRIII (222.7 M) were noted.
20.	Aqil and Ahmad.,2013	Properties of several historically used Indian medicinal herbs with broad-	Indian	Experimental	Ethanolic excerpts of 22 traditionally used Indian medicinal plants were studied for the effectiveness of their antimicrobial properties against seven bacteria (*Staphylococcus S. aureus the bacterium S. typhimurium, S. paratyphi, S. typhi, E. coli,*	Crude extracts of the following plants were found to have broad-spectrum antimicrobial activity, including antibacterial and antifungal properties: the excerpts of *Bryophyllum pinnatum* (leaves), *C.*	The study demonstrated that *Ficus religiosa, Trigonella foenum-graecum,* and *Cichorium intybus* root, leaf, and leaf extracts all showed more antibacterial activity but

		spectrum antibacterial and antifungal			*Shigella dysenteriae* and *Pseudomonas aeruginosa*) and five filamentous fungal species (*Aspergillus niger, Alternaria alternata, Fusarium chlamydosporum, Rhizoctonia bataticola* and *Trichoderma viride*) and a yeast Candida albicans of clinical origin. 16 of these plant extracts had varying degrees of antibacterial properties when tested contrary to one or more test microorganisms. It was discovered that 17 and 9 plant extracts, respectively, had antifungal and anticandidal action.	*bonducella* (seeds), *Delonix regia* (flower), *Hedychium spicatum* (fruits), the herb Mangifera indica (leaves), *Murraya coenigii* (leaves), and *Syzgium cumini* (seeds).	less antifungal activity. In contrast, the roots and stems of *Pistacia integerrima* and *Rheum emodi* showed greater antifungal activity and less antibacterial activity.
21.	Hemaiswarya et al., 2009	Examining three Indian medicinal herbs side by side for their antibacterial properties	India	Experimental	This study discovered that F. religiosa leaf extracts had potent antibacterial activity, with a zone of inhibition measuring more than 10 mm against eight of the nine bacterial species examined. At a dose of 0.5 mg per disc, previous studies revealed that fruit isolates of F. religiosa showed strong antibacterial activity, but no antifungal activity. Due to DMSO's versatility as a solvent, poor antibacterial activity at concentrations that were under 2%, and low toxicity to mammals, it was chosen to dissolve a variety of compounds.	A few bacterial strains with high MIC were responsive to *F. religiosa, T. populnea,* and *H. tiliaceus'* antibacterial activities. With MIC values of more than 100 g/ml and inhibition zones smaller than 10 mm, the methanolic extracts of three plants were less effective against the majority of infections. F. religiosa inhibited S. typhi with a low MIC but a smaller zone of inhibition (7 mm). None of the microorganisms examined were inhibited by DMSO and solvent-negative controls.	*A. niger* and *P. chrysogenum* were not inhibited by the leaf extracts of *F. religiosa, T. populnea, or H. tiliaceus* but five fungal species were. In the potato-disc tumor assay, it was discovered that excerpts from the leaves of F. religiosa had an anticancer activity with a percentage inhibitory effect of over 20 percent. It was discovered that chloroform extracts were extremely active and might be the finest source of potent phytochemicals.
22.	Akhtar et al., 2000	Anthelmintic properties of plants with medicinal value with special reference to their application in animals in the Indo-Pakistan subcontinent	Pakistan	Review	One of the most significant groups of parasitic infections in the Indo-Pakistan peninsula, helminthiasis causes significant productivity losses in animals. Animals with helminths are treated with a wide range of anthelmintics. The development of helminth resistance against frequently used anthelmintics has, however, always been a problem for those who work in animal health care.	This study examines the effectiveness of various native plants used in animals as anthelmintics.	*According to the study, methanolic bark samples from F. religiosa had an anti-thelminthic effect on mature Haemonchus contortus worms. The anti-helminthic effects in the methanolic excerpts of F. religiosa were proven to be caused by ficin*

23.	Khan et al., 2011	Ethanolic excerpts from the stem bark of *Ficus religiosa* showed anti-ulcer action in rodents.	India	Experimental	The goal of the current study was to confirm the anti-ulcer potential of an ethanol extract from the bark of the stem of F. religiosa against in vivo indomethacin- and cold-restrained stress-induced stomach ulcer as well as pylorus ligation experiments. In all of the utilized assays, the extract (100, 200, and 400 mg per kilogram significantly (P 0.05) decreased the ulcer index. The extract also significantly (P0.05) raised the pH of stomach acid while lowering the amount of gastric juice and free and total acidities.	Animal studies have shown that the bark of *F. religiosa* possesses potent anti-ulcer properties that are on par with those of ranitidine. The bioactive substances flavonoids, saponins, and tannins are probably to blame, but further research is required to validate the process and pinpoint the chemical components in question.	Although EBFR decreased physical activity, it did not exhibit any signs of toxicity or mortality. It was discovered to be effective in preventing the formation of stomach ulcers in groups exposed to PL and IND. Similar to the effects of 50 mg/kg ranitidine, it also decreased gastric juice production as well as free and total acidity.
24.	Charde et al., 2010	Evaluation of the anti-oxidant, wound-healing, and anti-inflammatories properties of ethanolic excerpts of Ficus religiosa leaves	India	Experimental	The objective of the current investigation is to assess the antioxidant, wound-healing, and anti-inflammatory properties of an ethanolic extract of Ficus religiosa leaves. The ethanolic extract made by the maceration method was tested for antioxidant activity using the DPPH radical acquiring technique and wound healing activity using the incision, excision, histopathological, and dead space wound models. The study was also supported by granuloma tissue analysis to determine the amount of hydroxyproline present and histopathological analysis.	The carrageenan-induced rat paw edema technique was used for the anti-inflammatory investigation. The tested extract exhibits activity in the range of 6.34 percent to 13.35 percent at various dilutions between 200 g/ml and 1000 g/ml. Increases in granuloma-breaking strength, skin-breaking strength, and wound closure rate were all significant. With less scarring, the hydroxyproline concentration also rose. With the results obtained, it can be concluded that Ficus religiosa extract has significant beneficial effects on wound healing and initial healing may be due to the presence of glycosides and tannins. The initial healing action may be due to increased collagen deposition and improved positioning.	*Ficus religiosa* leaves exhibit strong anti-inflammatory, wound-healing, and antioxidant action, it may be inferred. The bioactive component of plant extract is now the subject of more research.
25.	Uma et al., 2009	Ficus religiosa and Ficus bengalensis have antibacterial activity against	India	Experimental	Ficus religiosa L. and Ficus bengalensis L., both members of the Moraceae family, were studied for their barks' in vitro antibacterial efficacy and phytochemical composition. The antibacterial activity of the different solvent extracts, including	Plants and plant products have been used since prehistoric times. According to the World Health Organization (WHO), around 80% of the world's population relies mostly on traditional medicine, and the	These results point to a fresh route for identifying a potent antimicrobial compound in the *Ficus religiosa* L. and *Ficus bengalensis* L. species as a whole. These results require

		diarrheal enterotoxigenic E. coli in vitro, according to phytochemical analysis.			water, methanol, chloroform, petroleum ether, and hexane, against Enterotoxigenic E. coli isolated from diarrheal patients was tested. The methanol-based extracts of both plants contained carbohydrates, flavonoids, amino acids, steroids, saponins, and tannins, according to a preliminary phytochemical investigation. The extracts were tested using the disc diffusion technique for antibacterial activity against enterotoxigenic E. coli (ETEC) at a concentration of 200 mg/ml. In comparison to chloroform and aqueous extracts, the antibacterial activity findings showed that methanol extracts of both plants' barks demonstrate excellent activity.	primary component of traditional therapy is the use of plant extracts. The methanol extract was shown to be more effective than the other solvent extracts in the current investigation against all Enterotoxigenic E. coli that was isolated from diarrhea patients.	confirmation through in vivo research.

Table 2: Recommendations based on evidence

Author (Publication year)	**Study Design/ Analysis**	**Evidence base**	**Comments based on the evidence**
Ghosh et al., (2016).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Kaur et al., (2010).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Cagno, et al., (2015).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Singh et al., (2016).	Review	Weak	It indicated weak recommendations because it is a theoretical-based study.
Sahoo, (2012).	Review	Weak	It’s indicated the weak recommendations because it is theoretical based study.

Ahuja et al., (2011).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Patil et al., (2011).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Singh & Goel, (2009).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Kapoor et al., (2011).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Singh, Singh, & Goel, (2011).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Yadav & Srivastava, (2013).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Verma, & Gupta, (2015)	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Raisagar et al., (2019).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Choudhari et al., (2013).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Murugesu et al., (2021).	Review	Weak	It indicated weak recommendations because it is a theoretical-based study.

Sankar et al., (2014).	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Pandit et al., 2010	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Mousa et al., 1994	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Gulecha and Sivakumar., 2011	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Aqil and Ahmad.,2013	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Hemaiswarya et al., 2009	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Akhtar et al., 2000	Review	Weak	It indicated weak recommendations because it is a theoretical-based study.
Khan et al., 2011	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Charde et al., 2010	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.
Uma et al., 2009	Experimental model	Medium	Based on the animal experimental model in the study it shows limited recommendations.

Table 3. Critical appraisal of the selected 25 articles based on the JBI checklist.

Included articles	**Critical appraisal 1** (The criteria for inclusion in the sample are clearly defined)	**Critical appraisal 2** (The study subjects & the setting are described in detail)	**Critical appraisal 3** (Exposure measured in a valid and reliable way)	**Critical appraisal 4** (The objectives, and standard criteria used for measurement of the condition)	**Critical appraisal 5** (Confounding factors identified?)	**Critical appraisal 6** (Strategies to deal with confounding factors stated)	**Critical appraisal 7** (The outcomes measured in a valid and reliable way)	**Critical appraisal 8** (Appropriate statistical analysis used)
Ghosh et al., (2016).	x	1	1	1	0	1	1	1
Kaur et al., (2010).	x	1	1	1	0	1	1	1
Cagno, et al., (2015).	x	1	1	1	0	1	1	1
Singh et al., (2016).	1	1	99	99	0	x	99	99
Sahoo, (2012).	1	1	99	99	0	x	99	99
Ahuja et al., (2011).	x	1	1	1	0	1	1	1
Patil et al., (2011).	x	1	1	1	0	1	1	1
Singh & Goel, (2009).	x	1	1	1	0	1	1	1
Kapoor et al., (2011).	x	1	1	1	0	1	1	1
Singh, Singh, & Goel, (2011).	x	1	1	1	0	1	1	1
Yadav & Srivastava, (2013).	x	1	1	1	0	1	1	1
Verma, & Gupta, (2015)	x	1	1	1	0	1	1	1
Raisagar et al., (2019).	x	1	1	1	0	1	1	1
Choudhari et al., (2013).	x	1	1	1	0	1	1	1
Murugesu et al., (2021).	1	1	99	99	0	x	99	99
Sankar et al., (2014).	x	1	1	1	0	1	1	1
Pandit et al., 2010	x	1	1	1	0	1	1	1
Mousa et al., 1994	x	1	1	1	0	1	1	1
Gulecha and Sivakumar., 2011	x	1	1	1	0	1	1	1
Aqil and Ahmad.,2013	x	1	1	1	0	1	1	1
Hemaiswarya et al., 2009	x	1	1	1	0	1	1	1
Akhtar et al., 2000	1	1	99	99	0	x	99	99

Khan et al., 2011	x	1	1	1	0	1	1	1
Charde et al., 2010	x	1	1	1	0	1	1	1
Uma et al., 2009	x	1	1	1	0	1	1	1

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