

## A Comprehensive Analysis of the Therapeutic Efficacy of Sida Genus

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### Abstract:

Herbs have been utilised human beings for hundreds of centuries as an origin of medicine and food. Rheumatic affections, azoospermia, oligospermia, and spermatorrhea, leucorrhoea, wounds, sciatica, nervous and heart diseases, colds, cough, asthma, tuberculosis, and respiratory diseases, diseases of the blood, and biliary diseases are just some of the conditions that indigenous people from tropical regions have been found to use different parts of the Sida spices plant to treat. Traditional medicine attributes the plant's diverse properties and uses to the abundance of active compounds found in the plant extract, including alkaloids, saponins, saponin derivatives, coumarins, steroids, tannins, phenolic compounds, cardiac glycosides, sesquiterpene, and flavonoids. This study aims to evaluate the literature on the ethnomedicinal uses, phytochemical profiles, pharmacological effects, and toxicity of Sida spices.

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### Introduction

People have relied on the nutritional and curative advantages of medicinal plants ever since civilisation began. Many modern medications may be traced back to their ancestors in the thousands of years that mankind have been using natural sources to develop therapeutic chemicals. Several of these isolations resulted from the drugs' traditional medicinal use. Sida species *Bunn.f* (Malvaceae) is a plant used by locals as a treatment for a variety of conditions, including diabetes and hypertension. This plant is an annual plant or shrub that may grow up to 1.5 m in height [1]. Its branches stand straight and branched. Extremely rough, thin, long, cylindrical, and with smooth, greenish bark is the root of this tree. It has lanceolate,

somewhat hairless leaves on peduncles that are identical in length as the petioles. Its flowers may be either solitary or in pairs, and its smooth, dark-colored seeds are yellow [2, 3]. It is common in the country's western region, where it goes by the name "sengh," and may be found growing wild in fields, waste areas, and along the sides of highways. Sida is a particularly popular moniker for it. Once the plant has grown established, it becomes quite aggressive and begins to invade the territory of neighbouring plants. This plant might be easily reproduced either by planting seeds or by clipping stems.

### Folklore uses

This tree's leaves, bark, root, seeds, and

flower, together with its other parts, are used to cure a variety of illnesses.

### Traditional uses

Although patients often want the leaves, the whole plant is used for medicinal reasons. Demulcent, diuretic, anthelmintic, and wound-healing characteristics are sought for in plant leaves for the treatment of rheumatic illnesses [4,5]. A decoction made from the leaves is used to treat a variety of conditions, including azoospennia, oligospennia, and azoospennia [6,] as well as stomach ache. The juice extracted from the leaf is also used to treat nausea and vomiting in India [7, 8]. They aid in the healing process of TB as well as other injury-related illnesses including cardiac issues, coughs, and respiratory problems. The *Sida* species' roots have been studied for their potential as an adaptogen, immunomodulator, nutritional tonic, and life-extension agent. The root has been touted for its plethora of medicinal uses, including as an aphrodisiac, antirheumatic, stomachic, diaphoretic, diuretic, and antipyretic [8]. Root extract is used to treat a wide variety of conditions, including leucorrhoea [9], respiratory issues [10], and cough [11]. As well as the staleness of the [old], the novelty of the [new] is not lost on [the guinea pigs. Traditional Indian medicine often makes use of it because of its stomachic, diaphoretic, and antipyretic actions. Historically, it has been used to treat mental and urinary troubles, as well as blood, bile, and liver ailments [12]. Its hot water extract has also been used as a febrifuge, diuretic, and abortifacient. In addition, it is used to treat ulcers, gonorrhoea, elephantiasis, and is thought to have aphrodisiac effects. Burns and wounds are treated by applying the root juice directly. Even though it hasn't been proven, most people feel that the entire plant extract may help with things like fever, headache, skin disorders, diarrhoea, and dysentery [14]. In addition to being utilised as a demulcent to treat gonorrhoea and chronic diarrhoea, it is also exploited as a diuretic in

the treatment of rheumatic disorders. Women who suffer from gonorrhoea, spennatorrhea, leucorrhoea, facial paralysis, TB, sciatica, haemorrhage, or rheumatism might consider using this siddha formulation component. In Nicaragua, asthma, fever, aches and pains, ulcers, and as an anti-worm drug are treated using an infusion made from the whole plant [16, 17]. Abortifacient, antiemetic, and antihistamine effects have been shown for the plant [15]. In contrast, a decoction of the whole dried plant is used orally to cure sexual diseases. Central Americans rely on this plant to alleviate symptoms of asthma, renal inflammation, the common cold, fever, headaches, ulcers, and even worms. Studies have shown that using the entire plant reduces the hemorrhagic effects of *Bothrops atrox* venom, hence it has been used to treat snake wounds all across Colombia [19, 20]. Cameroonians claim that the plant's effects include anti-inflammatory, anti-rheumatic, diaphoretic, febrifuge, sedative, anti-ulcer, and anthelmintic. Fever and rheumatism may be treated with a decoction of the whole plant, while intestinal worms can be eliminated with an infusion of the same. Similar decoctions are used to treat parasitic diseases like malaria [21]. When used as a poultice, the leaves may help alleviate headache pain. It's possible that chewing on the tooth's root can alleviate the discomfort. A decoction made from the plant's leaves may be used to disinfect wounds. The plant extract is occasionally called an abortifacient due to its ability to induce abortions.

In order to determine their chemical makeup, *Sida* spices have been the subject of several scientific studies. Studies of the plant are focusing on almost every aspect, with the exception of the leaves and roots.

### Reported phytoconstituents and nutrients

The *Sida* spices species was phytochemically screened, and the results showed the presence of alkaloids including

vasicine, ephedrine, and cryptolepine (the main alkaloid in the plant) [22,23], saponosides, coumarins, steroids including ecdysterone, -sistosterol, stiglnaterol, ampesterol, tannins, and phenolic compounds including evofoli (non-chloroquine- resistant strain). Both strains tested positive for resistance to chloroquine, indicating that the drug is ineffective against them. The antiplasmodial activity of the ethanolic extract was higher than that of the decoction [38], indicating that the former was more effective. Studies on medicinal plants used to cure malaria in Nigeria [39] found that Sida spices and many other plants had significant effectiveness against malaria parasites both in vitro and when experimentally infected mice were used as test animals. All available research indicates that Sida spices have a potent antiplasmodial action.

Experimental rats were killed by Akilandeswari and colleagues when they discovered that the use of aspirin, ethanol, and Pylorus ligation induced stomach ulcers. After administering an ethanolic extract of the Sida spice leaves, the extract's effects on the mice were evaluated. The ulcer indices in the test medication groups were determined and compared to those in the control group and with those of Famotidine 20mg/kg (used as reference medicine) to evaluate the antiulcer activity of the various drugs. Significant antiulcer activity was demonstrated at 200 mg/kg of the extract against the aspirin (300 mg/kg) plus pylorus ligation model, and at 200 mg/kg of the extract against the aspirin (300 mg/kg) plus pylorus ligation model, both of which outperformed the famotidine group. Malairajan et al. [41] found that an ethanol extract of the whole Sida spices plant had antiulcer activity, and they concluded that it was effective. Rats were given aspirin with pylorus closure, HCI-ethanol-generated ulcers, and water immersion stress to induce stomach ulcers, and the extract was tested for its ability to alleviate these

conditions. The ethanol extract was shown to significantly reduce ulcer prevalence in the first two models tested. Sida spices have been shown to have antiulcer effects, although the precise processes by which this occurs have not been investigated. This effect is likely due to the plant's flavonoid compounds, tannins, steroids, and triterpenoids. Flavonoids have been shown to have strong antiulcer action in a number of experimental models of gastric and duodenal ulcers [28].

*Treatment for Infectious Wounds:* Topical use of methanol extract of Sida cutis ointment was studied by Akilandeswari and colleagues, who found it to be efficacious in two different wound models in rats [40]. They noticed that they worked in both instances. Extract-treated wounds in the excision model epithelized and constricted at a higher rate than control wounds. Results from studies on incision wounds showed that when compared to their respective controls, wounds treated with Sida spices ointment and the gold standard Nitrofurazone ointment significantly increased their tensile strength after 10 days. We inferred that the methanol extract of *S. cerevisiae* can heal from cuts and scrapes. Statistical analysis showed that eduleonoides ointment outperformed the placebo in all kinds of wounds studied. Adetutu and coworkers found 36 kinds of plants that are utilised in traditional wound healing treatments.[42]. Sida spices is only one of several plant extracts shown to exhibit antioxidant and antibacterial activity, showing that all plant extracts have therapeutic potential. The results of this research support the common sense use of herbs for treating wounds.

*Hepatoprotective effects:* The hepatoprotective effects of the methanol extract of Sida spices against liver damage caused by paracetamol overdose were demonstrated by decreased serum levels of glutamate pyruvate transaminase, glutamate oxaloacetate transaminase, glutamate oxaloacetate transaminase,

alkaline phosphatase, bilirubin, and compared to the intoxicated controls [43]. The liver's histology also provided supporting evidence for the drug's hepatoprotective effects. The hepatoprotective properties of Sida spices extract were shown in a rodent model by reducing the severity of acute hexobarbitone-induced narcosis. The phenolic component ferulic acid found in the root of Sida spices has shown to have a strong hepatoprotective impact.

Plants native to the Indian Western Ghats were studied for their cardioactive properties by Kannan and colleagues. The relationship between heart rate (HBR) and blood flow during diastole and systole was studied in Zebrafish embryos [44].

Parasitic [anti-fungal] activity [was assessed]. Anti-viral [was evaluated]. The HBR of Zebrafish embryos was reduced more by the methanol extract of Sida spices than by Nebivolol (the standard drug used for comparison). It took two separate procedures utilising two common solvents (95 percent chloroform and ethanol) to extract the active components from the powdered leaves. It took longer to complete each successive stage. Using the agar well diffusion method, the researchers discovered that ethanol extracts had the highest antibacterial activity (86%), followed by hot water extracts (61%), and cold water extracts (40%). Mortality studies showed that ethanol and hot water extracts killed test organisms in 0-10 minutes, whereas cold water extracts killed them in 5-60 minutes. The findings confirmed the findings of previous research showing that the antibacterial activity of Sida spice extracts was rather high against *Staphylococcus aureus* isolates obtained from HIV/AIDS patients. Studies have shown that Sida spices may be effective in treating common illnesses and may be useful in treating *Staphylococcus aureus* infections, which are opportunistic infections that plague people with

HIV/AIDS.

An ethanol extract of Sida spice leaves and stems had a profound impact on the central nervous system in an experiment done by Dora et al. Extracts were shown to kill a large number of the target pests, as shown by the average mortality. Antioxidant activity: To evaluate the antioxidant potential of Sida spices, 24 adult wistar rats were subjected to a series of treatments separated by varying amounts of time. The bioassay showed that the poisonous effect of the extracts was proportional to the concentration used, and that the observed overall mean mortality increased with increasing treatment intervals.

Six albino rats were split into four groups [25]. The results show that the antioxidant activity of Sida spices is quite high. Only feed and water were given to Group 1, while the other groups received either 20, 40, or 60 mg/kg of body weight of an ethanol leaf extract of Sida spices. The rats were treated for a single day and then sacrificed; their plasma was collected and utilised to detect oxidative stress. Mean values of plasma malondialdehyde concentration were found to be significantly lower (P0.05) and reduced glutathione concentration was found to be significantly higher (P0.05) at doses of 40 and 60 mg/kg body weight, respectively, compared to the control group. The plasma catalase and superoxide dismutase activity of the rats administered 60 mg/kg body weight was substantially higher than that of the control group (P0.05). In a dose-dependent study, it was shown that an ethanol leaf extract of Sida spices has antioxidant properties, hence it was utilised to treat acute oxidative stress in rats.

Extracts of Sida spices leaves were tested in petroleum ether, acetone, ethanol, and water for their antipyretic efficacy. Over time, the use of all extracts was demonstrated to reduce core body temperature, with the acetone extract demonstrating the most potent antipyretic effects. The ethanol extract was shown to

be the most effective in reducing fever, and its effects might be seen in as little as 1.5 hours. Researchers observed that the hemorrhagic impact of *Bothrops atrox* venom might be mitigated by using an ethanolic preparation of the whole *Sida acuta* plant [49].

Studies on the effects of *Sida* spice aqueous and methanol extracts on blood glucose levels in normal and diabetic rabbits were conducted using glucose-loaded animals [51]. The anti-diabetic properties of the extracts were also investigated in alloxan-induced diabetic rabbits. The data demonstrated that both extracts, at 400 mg/kg, substantially enhanced the nonnal rabbits' tolerance to glucose as compared to the control group. After 5.5 hours, blood glucose levels were considerably ( $p < 0.05$ ) lower after the glucose load than they had been before. This decline lasted all day long (10.5 hours total). Anticancer activity: Mallikarjuna et al. [52] studied the effects of ethanol extracts of *Sida* spices on NDEA- and CC14-induced hepatocellular carcinoma in wistar rats, finding that the extracts reduced tumour size and inhibited apoptosis. Anticancer effects of the extracts were found. After 28 days of treatment with 200 and 400 mg/Kg body weight of an ethanol extract of this plant, elevated serum levels of SGOT, SGPT, ALP, LDH, and GGT were reduced and protein synthesis was significantly increased in a dose-dependent manner.

Using the tail immersion and mouse ear-oedema models in mice and rats, researchers examined the analgesic and anti-inflammatory properties of *Sida scuta* [53]. Antioxidant enzyme activity, which protect cells from oxidative stress, were also shown to be significantly increased in the extracts. The crude extract of the plant was proven to have statistically significant ( $p < 0.001$ ) analgesic and anti-inflammatory properties in mice. The analgesic efficacy of *Sida* spices leaf extra was studied by Mridha et al. using petroleum ether, acetone, distilled water, and aqueous plant

extracts. The acetone extract of the leaf had the highest analgesic efficacy compared to the other extracts. This lends credence to the common use of *Sida* spices are used to reduce swelling and discomfort [55].

### Conclusion:

*Sida* spices have a long history of usage in traditional medicine for the treatment of a broad variety of body ills, and their use has spread to many nations throughout the world, including the United States. Traditional medicine practitioners employ every part of the plant—leaves, bark, root, seeds, and flowers—to treat their patients. The plant's antioxidant, antimicrobial, and antibacterial properties, as well as its cardioprotective, analgesic, antipyretic, hepatoprotective, hypoglycemic, insecticidal, and anticancer effects, were all examined. No negative impacts were seen, and all results were encouraging. Alkaloids, saponins, coumarins, steroids, tannins, phenolic compounds, cardiac glycosides, sesquiterpenes, and flavonoids are only some of the bioactive components present in the plant extract that contribute to its wide range of characteristics and traditional medicinal use. The great nutritional value of the plant is supported by the abundance of minerals and vitamins it contains. The purpose of this analysis of *Sida* spices was to create a foundation upon which to build scientific judgements about the extract and the therapeutic potential of its bioactive components.

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