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Review on Phytochemical Activity of Sida Acuta

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A B S T R A C T

Medicinal plants, also called medicinal herbs, have been discovered and used in traditional medicine practices. since prehistoric times, Plants synthesize hundreds of chemical compounds for various functions including defense and protection against insects, fungi, diseases, and herbivorous mammals. Whether in traditional medicine or modern medicine, plants for medicinal purposes are used to treat specific conditions, maintain health, or both. In 2002, the FAO estimated that more than fifty thousand medicinal plants were used worldwide. In 2016, the botanical garden at Kew estimated that 17,810 plant species - out of about 30,000 plants. Approximately 25% of medications prescribed to patients in modern medicine are derived from therapeutic plants and undergo extensive testing. Medicinal plants may make up a bulk of what are frequently haphazardly attempted, untested treatments in other medical systems. Without solid data, WHO projects that about two billion people rely mostly on medicinal plants, accounting for about 80% of the global population that primarily uses traditional medicine. In developed nations, there is a growing trend of using plant-based materials, such as herbal or organic supplements with purported health benefits. Even though herbal remedies have a safe reputation, there are hazards related to toxicity and other adverse impacts on human health associated with them. The use of herbal remedies dates back long before the development of modern medicine. Medicinal plants can benefit society in three ways: firstly, by improving the health of those who use them as medicines; secondly, by generating income for those who harvest, analyse, and sell the plants; and thirdly, by creating jobs, generating tax revenue, and promoting a healthier work force. However, a lack of solid scientific backing, subpar drug development procedures, and inadequate funding impede the creation of plant-based medicines or extracts with potential medical applications. Sida Acuta is also known as Arivalmooku, Pachilai, or Valtatiruppi in Tamil. It is a shrub-like plant also considered a weed, or wireweed. It is found in Central America and has an origin in Central America. It is well known for its diuretic, demulcent, anthelmintic, and wound-healing properties. This plant is used in various forms to treat indigestion, bath wounds, fever, skin disease, diarrhea, dysentery, and headaches. It also helps to stop bleeding wounds and strengthen the fetus. This plant is native to Mexico and Central America. Sida acuta has many pharmacological activities, such as antiplasmodial, antimicrobial, antioxidant, and cytotoxic properties. The plant Sida acuta has a special spiritual practice. Modes of administration include oral route, direct application of paste over skin for skin diseases, and snake bite. The various compounds, like alkaloids and steroids, are isolated as a result of phytochemical screening.

Keywords: Sida acuta, cytotoxicity, phytochemical screening, antimicrobial, demulcent.

1. INTRODUCTION:

Since ancient times, traditional medical practises have utilized. Medicinal plants, also called medicinal herbs, have been discovered and used in traditional medicine practices since prehistoric times. Plants synthesize hundreds of chemical compounds for various functions, including defense and protection against insects, fungi, diseases, and herbivorous mammals. Whether in traditional medicine or modern medicine, plants for medicinal purposes are used to treat specific conditions, maintain health, or both. In 2002, the Food and Agriculture Organisation estimated that more than fifty thousand medicinal plants were used worldwide. In 2016, the botanical garden at Kew estimated, more cautiously, that 17,810 plant species—out of about 30,000 plants for which any kind of use is recorded—have medicinal uses. Approximately 25% of medications prescribed to patients in modern medicine are derived from therapeutic plants and undergo extensive testing. Medicinal plants may make up a bulk of what are frequently haphazardly attempted, untested treatments in other medical systems. Without solid data, the World Health Organisation projects that about two billion people rely mostly on medicinal plants, accounting for about 80% of the global population that primarily uses traditional medicine. In developed nations, there is a growing trend of using plant-based materials, such as herbal or organic supplements with purported health benefits. Even though herbal remedies have a safe reputation, there are hazards related to toxicity and other adverse impacts on human health associated with them. The use of herbal remedies dates back long before the development of modern medicine. Medicinal plants can benefit society in three ways: firstly, by improving the health of those who use them as medicines; secondly, by generating income for those who harvest, analyse, and sell the plants; and thirdly, by creating jobs, generating tax revenue, and promoting a healthier work force. However, a lack of solid scientific backing, subpar drug development procedures, and inadequate funding impede the creation of plant-based medicines or extracts with potential medical applications.

Sida Acuta is also known as Arivalmooku, Pachilai, or Valtatiruppi in Tamil. It is a shrub-like plant also considered a weed, or wireweed. It is found in Central America and has an origin in Central America. It is well known for its diuretic, demulcent, anthelmintic, and wound-healing properties. This plant

is used in various forms to treat indigestion, bath wounds, fever, skin disease, diarrhea, dysentery, and headaches. It also helps to stop bleeding wounds and strengthen the fetus. This plant is native to Mexico and Central America. Sida acuta has many pharmacological activities, such as antiplasmodial, antimicrobial, antioxidant, and cytotoxic properties. The plant Sida acuta has a special spiritual practice. Modes of administration include oral route, direct application of paste over skin for skin diseases, and snake bite. The various compounds, like alkaloids and steroids, are isolated as a result of phytochemical screening. FLOWER DESCRIPTION:Sida acuta is Bisexual Flower. Its color is yellow or golden. Grouping

Scientific classification:
Kingdom: plantae
Clade: Tracheophytes
Clade: Angiosperms
Clade: Eudicots
Clade: Rosids
Order: Malvales
Family: Malvaceae
Genus: Sida Sida
Species: S.acuta

1.1 Plant description:

Sida Acuta required a little water. It can grow in full sun and is a drought-tolerant shrub. It is angiosperms. The mode of nutrition of Sida acuta is autotropic. It can reach up to a maximum of 1 meter. The native distribution of Sida acuta is in tropical America. The native habitat of Sida acuta is terrestrial. The flower of Sida acuta is light yellow and star-shaped. The flower of Sida acuta is 6–10 mm long. It has five petals with irregularly notched tips and fused bases. In Cameroon, the species is known as "singh" in the western region of the country. It grows in profusion on farmed fields, waste areas, and roadside locations. Sida is its common name. Once a plant is established, it becomes highly competitive in holding and denying other plants' locations. Cuttings of stems and seeds can both be used to multiply plants. This tree's entire anatomy—leaves, bark, roots, seeds, and flowers—is utilized in traditional medicine.

1.2 Vernacular name:

Sanskrit: bala
Hindi: karta/kharente
Tamil: Malaidangi, Arivaal mooku pachilai
Telungu: nelabenda
Marathi: chikana

1.3 Special practices according to area:

In India, coconut oil is mixed with the paste of sida acuta and applied to the head for dandruff and healthy, strengthening hair. In western Colombia, the whole plant of Sina acuta is used for snake bites. In Sri Lanka, the roots and leaves of Sina acuta are used to treat hemorrhoids, fever,impotency, gonorrhea, and rheumatism. In Togo, its leaves are used for eczema and kidney stones.

1.4 Chemical compounds:

The family Indoloquinolinesd is present in the alkaloids of this plant. Cryptolepine is the main alkaloid. Quindoline, quinoline, cryptolepinone, and 11-methyl quindoline are its derivatives. Ecdysterone, beta-sitosterol, stigmaterol, and ampesterol are the major steroids of this plant. Evofolin A and B, scopoletin, vomifoliol, loliolid, and 4 ketopinoresinol are some phenolic compounds in this plant. The natural alkaloid 5-methyl indolo [2,3b]-quinoline, or cryptolepine, was first discovered in the root system of Cryptolepis triangularis and is found in S. acuta. The primary alkaloid in the roots of Cryptolepis sanguinolenta, an herb historically utilized in West and Central Africa to treat rheumatism, infections of the urinary tract, and lung infections, is this compound. According to Bonjean et al. (1998), cryptolepine has a wide range of biological features, including dehydrated and antipyretic, antimuscarinic, antibacterial, and anti-inflammatory actions. In addition, it has strong in vitro action on P. falciparum, the primary malaria-causing parasite species. It is still unknown how this antimalarial medication works, but at least two separate effects may combine to provide a powerful activity. According to Bonjean et al. (1998), it first acts like a DNA intercalator. Blocking the detoxification of heme in red blood cells may also mimic the effects of chloroquine (Wright et al., 2001). According to a study using fluorescence microscopy, cryptolepine may accumulate in parasite structures that resemble the parasite nuclei (Arzel et al., 2001). Cryptolepine did not, however, successfully treat malaria in mice when administered orally, and it was harmful when administered intraperitoneally. These findings prompted research into its synthetic equivalents, including 2,7-dibromocryptolepine (Wright, 2005).

SIDA ACUTA (PLANT PICTURE):

Sida acuta plant

3. PHYTOCHEMICAL PROFILE:

3.1 Neuropharmacological effects:

Karou et al. published the first report on this plant in 2003. The clinical specimen containing Plasmodium falciparum carried out the task. Anani et al. used the disc diffusion assay method to perform the first antimicrobial screening in 2000. They discovered that some microorganisms are significantly affected by plant methanolic extraction, whereas others are not much affected. It shows positive results for Staphylococcus aureus, E. coli, Bacillus subtilis, and Mycobacterium phlei. It shows negative results for Klebsiella, pneumonia, Salmonella Typhimurium, pseudomonas aeruginous, and candida albicans. This result demonstrates the fact that the phenolic compound possesses potent in vitro antibacterial properties and that the holding time of the extracts significantly affected this activity, probably as a result of the phenolic compounds' oxidation

3.2 ANTIMALARIAL ACTIVITY:

Karou et al. studied the antimalarial properties of five plants, including Sida acuta, that are used in Burkinabe traditional medicine to treat malaria. Fresh clinical specimens of Plasmodium falciparum were used in the in vitro testing of these plant extracts. Sida acuta was shown to be the study's most active plant, with an IC50 value of 4.37 g/mL. In a different study, Marimuthu investigated the larvicidal and repellant properties of crude Sida acuta leaf extract against three significant mosquito species. The findings demonstrated that the plant's crude extract had a potent insecticidal effect against the three kinds of mosquitoes under investigation. Two strains of Plasmodium falciparum—a Cameroonian (chloroquine-resistant strain) and a Nigerian (chloroquine-sensitive strain) strain—were used to assess the in vitro antiplasmodial activity of the ethanolic extract and water decoction of the aerial section of Sida acuta from the Ivory Coast. The antiplasmodial activity of the ethanolic extract was superior to that of the decoction [38]. In Nigeria, medicinal herbs are utilized to cure malaria, according to research by Adebayo et al. In vitro and in mice that were experimentally infected, Sida acuta and a few other plants showed strong efficacy against malaria parasites. These several investigations have demonstrated Sida acuta's potent antiplasmodial effectiveness. Its alkaloid content is mostly responsible for this function. In actuality, the antiplasmodial component is the alkaloid cryptolepine

3.3 Cardiovascular activity:

Indian Western Ghats herbs were tested for cardioactivity by Kannan et al. Zebrafish embryos were used to assess the heart's pumping rate (HBR) and flow of blood during both rhythms. The HBR in the embryos of Zebrafish decreased more as a result of the Sida acuta methanol extract than it did as a result of the reference drug Nebivolol

3.4 WATER PURIFIER:

Sida acuta serves to eliminate fluoride from water during purification. In an experiment, water samples from certain communities in the Bhiloda taluka (with a fluoride value of about 1.55 mg/L) were treated with this plant's leaves to determine how they affected the amount of fluoride in those samples. The outcome demonstrated that the fluoride content was reduced to 1.42 mg/l with the use of leaf extracts. Therefore, it may be said that this plant's leaves help reduce the fluoride content of water. This outcome is crucial because it demonstrates how sida acuta extract can be used to filter water. Fluoridation in excess can be fatal to humans. It causes a wide range of illnesses, including skeletal fluorosis and dental fluorosis.

3.5 TOXICITY:

A study on the acute toxicity of Sida acuta on rats by Mallikarjuna et al. showed that up to a dosage level of 2000 mg/kg of body weight, there was no death in animals given this plant's extract. Pieme et al. earlier indicated a similar outcome. So, the extract from this plant was determined to be secure.

CONCLUSION:

S. acuta is a plant that is frequently used in conventional medicine. Numerous laboratory studies on the effectiveness of the plant have been carried out using conventional methods. It is now clear that the plant's alkaloids, particularly cryptolepine, its major alkaloid, have a good antiplasmodial effect. Additionally, it is shown that the plant affects several bacterial strains. Since the plant hasn't been examined for all its desirable pharmacological activities, there may be many more chemicals that have been extracted from it that have been shown to have significant pharmacological properties on their own. It should nevertheless be emphasized that all lab screenings have been conducted using traditional laboratory extraction methods, as is frequently the case with other herbal remedies. Traditional research methods have not been used in any studies, so this needs to be the top goal for two reasons. First, even if laboratory tests do not support the expected activity, people continue to use the plant. As a result, the laboratory findings under the circumstances of conventional application are more significant and can directly enhance this usage. Second,many of these 2958 Afr. J. Biotechnol. isolates act synergistically at times; thus, fractionation may cause the activity to be lost. Additionally, creating a medicine from a single pure component may be prohibitively expensive, making it unlikely that our communities will be able to buy it.

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