

Cassia alata's chemical makeup, practical use and pharmacological effects

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ABSTRACT

Cassia alata, also referred to locally as Ketepeng Cina in Indonesia and Gelenggang in Malaysia, has been used traditionally to cure a variety of illnesses, particularly skin conditions. Additionally, *C. alata* may have anti-allergy, anti-inflammatory, antioxidant, anticancer, antidiabetic, and antifungal properties. Flavones, flavonols, flavonoids glycosides, alatinon, alanonal, and -sitosterol-

D-glucoside are among the metabolite substances that have been identified from *C. alata*. The chemicals were primarily extracted from the leaves. Additional identification is required to find the secondary metabolites from other plant components, including as the seed, flower, and bark, which are said to have strong antibacterial and antifungal action.

INTRODUCTION

Argentina is the country of origin for the plant *Cassia alata*. Commonly known as *Senna alata*, Candle brush, and other names. Indonesians refer to *C. alata* as "ketepeng china." *C. alata* has evolved into a herb plant used to treat a variety of ailments in several nations, including France, in other parts of South Asia. Rheumatism and constipation can both be treated with *C. alata* root. In India, seeds and leaves are highly effective fungicides and eczema treatments. *C. alata* can be used to treat headaches, paralysis, and nausea during pregnancy. In several nations, *C. alata* extracts are employed in the practice of traditional herbal medicine to treat skin conditions. *C. alata* leaves are used to alleviate constipation in Thailand. This can be accomplished by applying fresh leaves to ringworm-infected skin after they have been pounded with water, garlic, red chalk, and balm. Additionally, the cooked shoots and leaves of *C. alata* can be applied to a wound to cleanse it and reduce inflammation. By crushing or rubbing the leaves of the *C. alata* plant directly on the affected skin, fungus on the skin that can cause hives and other symptoms has long been treated in Indonesia (particularly in South Sulawesi). There have been numerous investigations on the biological activity of *C. alata*. With an IC50 value of 2.27 g/m L, the

crude extract of *C. alata* leaf exhibits extremely potent antioxidant activity. *C. alata* leaf extract in n-hexane dramatically reduced rat knee swelling, demonstrating the leaf extract's effective anti-inflammatory properties. It has been noted that *C. alata* leaf extract has potent antifungal properties against other bacteria including the fungi *Trichophyton verrucosum* and *Epidermophyton floccosum*. Alkaloids, saponins, steroids, flavonoids, and terpenoids are among the secondary metabolite substances found in *C. alata*. In the tropics, *C. alata* is a plant that can grow unrestrictedly. *C. alata* belongs to the *Fabaceae* family. This plant has erect stems that are between 10 feet and 15 feet tall, skin on the stems that is thin and not spiky, and leaves that are slightly wider and yellowish green in color. The flowers grow in a race and have a vivid yellow color. When ripe, the brown seeds and hard fruit resemble a brown pod. Plants have been found to have biological properties, such as antidiabetic, antioxidant, antibacterial, etc. The biological effects of *C. alata* include antidiabetic, choleric, analgesic, antimicrobial, antiviral, anti-tumor, hepatoprotective, antidepressant, antimalarial, anthelmintic, cardiovascular, and anesthetic effects. It also has anti-allergic, anti-inflammatory, antioxidant, thrombolytic, anticancer and anti-tumor properties. In terms of clinical medicine, the plant has not been

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known to have any negative effects. For the first time involving people, the therapeutic effectiveness of *C. alata* leaf extract against Pityriasis versicolor has been documented. A straightforward process has been developed for the extraction of clinically useful antifungal chemicals from the leaves of *C. alata*. The leaf extract can be used with confidence as a herbal treatment to treat *P. versicolor*, according to a ten-year human trial. There are no adverse effects from the leaf extract. According to reports, *C. alata* possesses chemopreventive and bronchorespiratory effects against a variety of chemicals that damage DNA. According to folklore, *C. alata* is an antibacterial substance that can heal skin infections. It was discovered that the *C. alata* could make good herbal soap. Additionally, *C. alata* leaves were reported to be effective in treating burns and against clinical isolates of the bacteria *Vibrio cholerae*, *B. subtilis*, *S. aureus*, *Streptococcus sp.*, and *E. coli* as well as a few fungi, most of which are dermatophytes that cause skin infections in humans, such as *A. niger* and *A. flavus*. *T. mentagrophytes*, *T. tubrum*, *M. gypseum*, and *M. canis*, as well as *A. candidus*, *P. patulum*, *C. albicans*, and *R. stolonifer*. The leaves of *C. alata* have a variety of bioactive chemicals, according to reports. There have been reports of the chemical components of *C. alata* leaves from Thailand's Pattalung Province. To create methanol extract, the leaves were dried and macerated in methanol solvent for three days. To get six fractions, the methanol extract was further fractionated using a liquid vacuum gel chromatography technique and eluted with chloroform:methanol. Eight fractions were obtained after the fractions were separated using LH-20 sephadex column chromatography and eluted with methanol solvent. The yellow-colored fraction VII exhibited significant antioxidant activity. The

structures were identified using IR, ¹H NMR, and ¹³C NMR. The identification findings identified 1 as a particular sort of flavonol (kaempferol). Additionally, employing HPLC, the compound 2 (kaempferol-3-O-D-glucopyranoside) has also been found. An experiment performed using Swiss albino male mice weighing 24 to 28 g, it has been reported that *C. alata* does not appear to be harmful. Alcoholic *C. alata* leaf extract at 3,000 m g/k g body weight had no effect on the test animals' general behavior. Based on an investigation using male albino rats, it was stated that aqueous dry leaf extract of *C. alata* was not harmful at doses of 250, 500, and 1000 m g/k g (80 to 100 g). The liver and kidneys histology did not show any abnormal alterations. Furthermore, an experiment using albino wistar rats of either sex found that the aqueous extract of the *C. alata* flower was safe when given to rats orally (150 to 180 g). The liver, lung, kidney, spleen, and heart did not exhibit any notable alterations in their histological sections. However, the alkaloids extracted from *C. alata* at 250 to 1000 m g/k g indicated modifications to the liver and kidneys plasma membrane. Additionally, it was noted that emodin, kaempferol, aloe-emodin, and rhein caused mild hepatorenal damage. In Asian nations, the *C. alata* plant has been utilized as a natural remedy. The plant's leaves, seeds, stems, and flowers have all produced various secondary metabolite chemicals. According to research on *C. alata*'s biological activity that has been published by several researchers, it is scientifically shown that this plant possesses pharmacological properties. To further explore potentially medicinal substances, isolation research on secondary metabolite chemicals is still required.