

A Plant Review: *Mikania scandens* (L.) Willd

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Abstract : *Mikania* is the largest genus of tropical lianas, representing over 300 species. The plant *Mikania scandens* is reported to have antipyretic, antimicrobial, anti-inflammatory, anticarcinogenic and ulcer-protective activities. The plant contains a number of bioactive compounds such as Mikanin, friedelin, efifriedinol, some sesquiterpene-dihydromikernolide and phytosterols like stigmasterol and betasitosterol. The aim of the present review article is to give comprehensive information on Botanical description, phytochemistry, therapeutic uses and pharmacological activities.

Keywords : *Mikania scandens*, Pharmacology and Phytochemistry.

Introduction:

Many medicinal plants have been used all over the world for treatment of various diseases. In every year, there is an increase in demand of herbal medicines.¹

Most of the bioactive compounds present in plants may cause serious side effects that are dangerous for human health. Hence, the correct identification and separation of chemical structures of the major components is crucial, making the use of active medicinal plants safe.

The word *Mikania* is derived from its founder Joseph Gottfried Mikan, a professor at the University of Prague. The species name, *scandens*, comes from the Latin *scandere*, meaning "to climb". *Mikania* is the largest genus of tropical lianas, representing over 300 species.²



***Mikania scandens* (Aerial parts)**

Botanical description:

Mikania scandens is a perennial herb which grows as a branching vine. It is a native to USA and its distribution extends to India, Srilanka, China, Bangladesh and Africa.

It is a small herb having height of 2.5-3.0 cm. The stem is Herbaceous to semi woody, branched or ribbed. The leaves are simple, opposite, cordate or triangular leaves with long petioles. The flowers are small, having veins, white in color originating in axil of leaves. The corolla is pink, pale purplish, or rarely white. The fruit is somewhat flattened, elliptic, and 4-ribbed with short, white hairs along the ribs, with a tuft of white pappus at the summit with glandular, dark grey to black.^{3,4} The seeds are Cotyledons which are erect and solitary.⁵

Traditional uses:

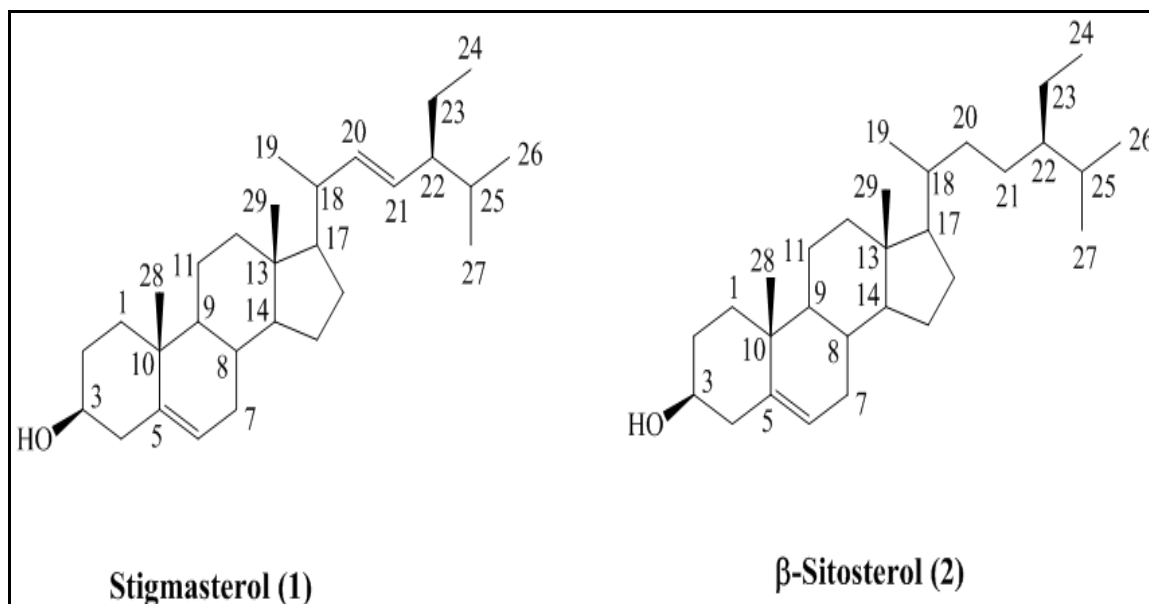
The leaves of *Mikania scandens* is used as ulcer protective agents and wound healing in traditional system of medicines. The leaves are also used as an antimicrobial, antipyretic and anti-inflammatory agent and as an anti cold used as decoction for coughs.

In African, folk medicine the plant is used for treatment of snake and scorpion bites.

It has also found its use as an antispasmodic and pain-reliever for rheumatism, arthritis, intestinal inflammation.

Phytochemistry:

The most significant components of *M. scandens* are flavonoids, alkaloids, steroids, tannins, saponin, gum. It also contains mikanin, friedelin, sesquiterpene, dilactones, including mikanolide, dihydromikanolide and scandenolide, kaurenic acid, butyryloxykaurenic acid, stigmasterol and beta sitosterin.^{6,7}



Pharmacological activity:

1. The analgesic activity- Hasan S M *et al* evaluated the analgesic activity of hydro methanolic extract of leaves of *M. scandens* for its peripheral and central actions using tail immersion method and the hotplate and acetic acid-induced writhing test in mice. The methanolic extract (250 and 500 mg/kg body weight), produced a significant increase in pain threshold in tail immersion methods and hotplate in a dose dependent manner. In acetic acid induced writhing test, the extract (500 mg/kg) produced a maximum of 53.73% inhibition of writhing reaction compared to the reference drug Diclofenac. The results concluded that the extract has a strong analgesic effect. In addition Ahmed M *et al* reported that the crude extract of *M. cordata* (1 and 3 g/kg)

and a sesquiterpene lactone deoxymikanolide (10 mg/kg) significantly inhibited acetic-acid induced writhing in mice.^{7,8}

2. The neuropharmacological activity- *Mikania* root extract possesses some neuropharmacological properties as shown by Bhattacharya S *et al* in the studies with methanolic fraction of *M. cordata* root extract on experimental animals. This caused alterations in the general behaviour pattern (e.g. suppression of aggressive behaviour, reduction in spontaneous motility), suppression of conditioned avoidance response and showed analgesic activity and antagonism to amphetamine toxicity. The observations suggest that the root of *M. cordata* possesses a potent central nervous system depressant action⁹.

3. CNS activity - Dey P *et al* studied that the hydro alcoholic extract of aerial parts of *M. scandens* showed CNS activity in Swiss albino mice. The results of their study revealed significant and dose-dependent (250 and 500g/kg body weight) central anti nociceptive, muscle relaxant, locomotor depressant and sedative potentiating effects of the plant extract.¹⁰

4. Antidiarrhoeal activity- Salgado HR *Net al* investigated that the aqueous extract of leaves *M. glomerata* (1000mg/mL) showed a decrease in the propulsive movements of the intestinal motility contents in mice. Oral administration produced an inhibition of gastrointestinal transit as effective as that produced by loperamide used as reference antidiarrheal drug. These findings suggested that the aqueous extract of the leaves of that plant have antidiarrheal effect which might be due to inhibition of intestinal motility¹¹.

5. Antiulcer activity- The studies of Bishayee A and Chatterjee M on the methanolic fraction of root extract of *M. cordata* showed antiulcer effects in rats, inhibiting gastric ulcers induced by aspirin, water immersion stress, ethanol, and phenylbutazone. The ED50 values of the extract in the above four ulcer models were found to be 125.5, 95.1, 109.7, and 136.2 mg/kg, respectively¹².

6. Estrogenic activity- We have evaluated the estrogenic activity of methanolic extract of *M. scandens* by the vaginal cornification and uterine weight method. The aerial parts of extract at dose level 400mg/kg body weight showed a significant increase in diameter of uterus and thickness of endometrium in immature rats. The plant *M. scandens* showed the presence of steroids, alkaloids, flavonoids, and polyphenolic compounds. The estrogenic activity of the plant may be attributed to the phytoestrogens present in it.¹³

Conclusion:

This article briefly reviews for ethnomedicinal description, pharmacological activity, phytochemistry and therapeutic uses of the plant *Mikania scandens*. It is observed from the review of this article that *Mikania scandens* can be used for the treatment of various diseases as antiulcer, anti-inflammatory, analgesic, CNS depressant and estrogenic drug. The plant contains different types of active compounds, such as mikanin, friedelin, sesquiterpene, dilactones including dihydromikanolide and also contain stigmasterol and beta sitosterin

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