HEMIDESMUS

Hemidesmus indicus L. R. Br. ex Schult

Family

Asclepiadaceae.

Parts Used

Root.

Description

Hemidesmus is a slender, twining and somewhat woody perenial vine found in South Asia and India. with a long and narrow root that is used medicinally. Hemidesmus has leaves that are opposite, smooth, shiny green and a firm texture. Though the leaves can vary depending on whether they arise from young shoots or from old roots. The plant has small, green flowers that are internally a deep-purple and the follicles are long, slender and spreading. The medicinal root is long, tortuous, cylindrical and furrowed with its cortex divided by transverse fissures into moniliform rings. It is brownish externally, has a weak somewhat bitter taste and a peculiar aromatic odour that is likened to a combination of cinnamon, vanilla and almonds.

Traditional Use

Hemidesmus, also known as Indian Sarsaparilla or Anantula, has been a well regarded member of the Ayurvedic Materia Medica for centuries. It was well introduced to the West in the mid 19th century. Hemidesmus has been used traditionally as a tonic, alterative, demulcent, diaphoretic, diuretic and blood purifier.

Used as an infusion, as boiling Hemidesmus through decoction destroys the volatile principles. It was employed in digestive disorders, sexually transmitted infections, including syphilis and

gonorrhoea, chronic rheumatism, urinary diseases and skin conditions. The herb has also been prescribed for male sexual impotence and low libido. In folk medicine, the plant has been described for use to induce a deeper sleep and to enhance dreaming. It's also used for rheumatism, kidney and nephritic conditions and candida infections.[1]

Constituents

Specific constituents of hemidesmus include coumarin, essential oil, steroids including sitosterol and beta-sitosterol, starch, glucosides, tannic acid and triterpenoid saponins.

Actions

Anti-inflammatory, depurative, antioxidant, astringent, immunosuppressant, tonic.

Pharmacological Activity

Digestive Activity

Hemidesmus was found to be more active than standard antidiarrhoeal drug, lomotil. The main constituents were found to be tannins, steroids, triterpenoids and carbohydrates. Hemidesmus was thought to elicit the antidiarrhoeal effect of intestinal motility and by bacteriocidal activity.[2] Another study found a similar antidiarrhoeal action of hemidesmus which was found to work via an increased absorption of fluid from the intestinal wall.[3]

Immunomodulatory Activity

Hemidesmus has been shown to depress cell-mediated immunity and the humoral immune system.[4] A decoction of *Nigella sativa* seeds, *Hemidesmus indicus* root bark and *Smilax glabra* rhizome has been used in cancer patients by a family of traditional medical practitioners of Sri Lanka. Research was conducted that showed a short term and long term treatment with the decoction was able to inhibit diethylnitrosamine mediated damage and subsequent cancer formation in rat livers.[5,6]

Antimicrobial Activity

The antimicrobial activity of *Hemidesmus indicus*, *Ficus bengalensis* and *Pterocarpus marsupium* was evaluated against pathogenic bacteria *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* in an *in vitro* condition. Aqueous extracts from the plants were tested for antimicrobial activity and hemidesmus showed inhibition at the range of 0.04mg to 0.1mg against the bacteria tested. The susceptibility of bacterial pathogens was in the order of *S. aureus*, *K. pneumoniae* and *P. aeruginosa*. The antimicrobial activity of plant extracts was synergistic with antibiotics tested.[7]

Twelve herbal extracts showing broad-spectrum activity were tested against specific multidrug-resistant (MDR) bacteria including methicillin-resistant *Staphylococcus aureus* (MRSA). Ethyl acetate, acetone and methanol fractions of more than six plants, including hemidesmus, indicated that the active phytocompounds were distributed mainly into acetone and ethyl acetate fractions. Gram-positive and Gram-negative MDR bacteria are almost equally sensitive to these extracts/fractions, indicating their broad-spectrum nature.[8]

Hemidesmus was studied for its action against anti-MRSA. The extract demonstrated concentration-dependent killing of MRSA with 9 to 12 hours of incubation. There was a synergistic interaction of hemidesmus with other herbal extracts as well as with one or more antibiotics tested. The study validated the use of hemidesmus in infectious disease.[9] Another similar study also found hemidesmus to be active against antibiotic resistant strains of *E. coli* and *E. shigella*.[10] The glycosides of hemidesmus root inhibited Salmonella-induced pathogenesis by reducing bacterial surface hydrophobicity. The herb also appeared to act by mimicking host cell receptors, thereby blocking its attachment and subsequent pathological effects.[11]

Additional research has stated that the presence of antimicrobial trace elements such as copper and zinc, along with other active constituents were thought to contribute to the anti-enterobacterial activity of hemidesmus.[12]

Herbs that have the potential to interact with NF-kappaB may be useful as anti-tumour compounds or for inflammatory diseases. Hemidesmus was found to inhibit NF-kappaB and had potential in these diseases.[13]

Antioxidant, Hepatoprotective and Chemoprotective Effects

Indian herbalists were found to use hemidesmus, along with other herbs, for the treatment of snakebite. The extracts were found to possess potent neutralising effects against snake venom.[14] Another earlier study found an active constituent in hemidesmus effectively neutralised viper venom-induced changes in serum phosphatase and transaminase activity.[15]

Various animal studies have found hemidesmus to be a potent antioxidant protecting against the liver, kidney and pancreatic injury.[16,17,18,19]

Hemidesmus indicus root has also been shown to possess significant genoprotective effect at low concentrations although it is cytotoxic and probably genotoxic at higher doses.[20] Another study found that hemidesmus displayed antimutagenic actions.[21]

The ethanolic extract of hemidesmus was studied for its otoprotective effects against gentamicin toxicity. Coadministration of hemidesmus was shown to significantly counteract the toxic effect of gentamicin on cochlear hair cells and prevent hearing loss/vestibular balance through inhibition of apoptosis.[22]

Hemidesmus root extract was found to protect microsomal membranes via a reduction in lipid peroxidation values as well as protect DNA from radiation induced strand breaks.[23]

A high free radical scavenging potential was found in another study into hemidesmus and other Ayurvedic plants with the active ingredient being phenolic compounds.[24]

Indications

- Inflammatory joint diseases, such as arthritis
- Autoimmune diseases
- Chronic skin diseases, such as atopic eczema, psoriasis, ulcers
- Prevention of chemical toxicity and liver damage
- Diarrhoea & digestive disorders

Energetics

Cool.

Use in Pregnancy

No adverse effects documented.

Contraindications

Although safe and generally considered non-toxic, due to its potential for immune suppression, the herb should be discontinued in states of active infection.

Drug Interactions

Research has shown possible synergistic effects with antibiotics and hemidesmus may offer otoprotective effects against gentamicin induced cochlear hair damage and prevent subsequent hearing loss/vestibular damage.

Administration and Dosage

Liquid Extract:	1:1
Alcohol:	45%
Weekly Dosage:	20 to 50mL
Dried herb:	3 to 6g daily

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