CRATEVA

Crateva magna (Lour.) DC.

Family

Capparaceae (or Capparidaceae), the caper family. *Crataeva nurvala* is a synonym.[1]

Parts Used

Bark.

Description

Crateva is a medium sized, branched, deciduous tree found in tropical and sub-tropical regions. It requires a dry, hot climate and shady places to grow effectively. The handsome foliage is made up of trifoliate leaves with beautiful cream coloured flowers. The fruits are egg shaped berries with multiple seeds embedded in yellow, fleshy pulp. The outer surface of the bark is grey and rough due to the presence of several small and rounded lenticels (pores).[2,3,4]

Traditional Use

Crateva is an Ayurvedic herb where it is commonly known as varuna. In Ayurveda it is frequently used in the treatment of urinary disorders that reoccur owing to antibiotic resistance by the infecting organism. Crateva has also been used in the treatment of prostate enlargement and bladder sensitivity. It is known to relieve, prevent and promote the discharge of kidney stones and is used in various inflammatory diseases such as urinary tract infection, rheumatoid arthritis and colitis. In Ayurveda it is also routinely used to treat neurological disorders associated with cognitive dysfunction such as dementia and Alzheimer's

disease. It has been hypothesised that crateva can have beneficial effects in hypothyroidism. Ayurveda supports the use of crateva in regulating equilibrium among the three doshas (bodily humours): Vata (air), Pitta (earth) and Kapha (mucous or water), whose imbalance leads to hormonal imbalance (Ojus), most commonly thyroid disorders.[5,6,7]

Constituents

Triterpenoids (lupeol, betulinic acid, lupenone), flavonoids (rutin, catechin, quercetin) and alkaloids (cadabicine), sterols.[8]

Actions

Anti-inflammatory, bladder tonic, diuretic, urinary disinfectant, antilithic (preventing the formation of calculi such as kidney stones).

Pharmacological Activity

Anti-inflammatory Activity

The results of a recent *in vivo* study indicate that crateva inhibits induced inflammatory responses via negative regulation of extracellular signal-regulated kinase in mouse macrophages suggesting that it is a candidate for alleviating severe inflammation.[10]

Diuretic Activity

Crateva was evaluated for the management of induced urolithiasis (urinary tract stones) in rats and was found to be helpful in reducing its recurrence. In the experiment crateva prevented stone formation and showed anti-crystallisation properties. It also decreased the urinary pH toward acidic. The diuretic action of crateva was helpful in reducing or normalising the serum and urinary creatinine and restoring the normal metabolism of the urinary system.[11]

Antilithic Activity

Crateva decoction lowered the induced increased levels of stone forming constituents in the kidneys of rats. The increased urinary excretion of the crystalline constituents along with lowered magnesium excretion found in stone-forming rats was also partially reversed by decoction treatment.[12]

Benign Prostatic Hyperplasia (BPH) Activity

Crateva has been shown to be effective for symptoms of BPH. In different clinical trials it has shown a significant anti-inflammatory effect especially pertaining to the genito-urinary tract.[13]

It is now widely accepted that not all BPH symptoms are due to enlargement of the prostate, particularly in older men, where an atonic bladder can contribute significantly to symptoms. In a study where thirty patients with hypotonic bladder due to BPH were given a decoction of crateva there was a marked improvement in frequency, incontinence, pain and retention of urine. Urine flow improved as well as an increase in bladder tone after therapy.[14]

Crateva increased bladder tone and bladder capacity in humans in cases of hypotonic bladder due to prostatic hypertrophy.[15]

Antioxidant Activity

The results of a recent *in vivo* study revealed that crateva had a significant protective effect in induced oxidative stress in rat prostates.[16]

Crateva demonstrated antioxidant effects *in vitro* with potent free radical scavenging ability in methanol and ethanol extracts.[17]

Antipyretic Activity

In vaccine induced fever, the fever was significantly reduced and the body temperature was normalised by oral administration of a 200 and 400mg/kg dose of crateva in rabbits.[18]

Antinociceptive Activity

The findings of an experimental animal study indicate that ethanolic extracts of crateva possesses antinociceptive properties and therefore lend pharmacological support to its traditional use in the treatment and/or management of painful, arthritic inflammatory conditions. Ethanolic extracts of crateva produced dose dependent, significant antinociceptive effect against chemically induced nociceptive pain stimuli in mice. The results obtained in this study suggest that the antinociceptive effect of the extracts of crateva are peripherally and centrally mediated.[19]

Cognitive Enhancing Activity

Crateva ethanolic extract significantly improved spatial learning and memory against induced amnesia *in vivo*. These results indicate that ethanolic extract of crateva might be useful as a nootropic agent to delay the onset and reduce the severity of symptoms associated with dementia and Alzheimer's disease. The underlying mechanism of action of its nootropic potentiality might be attributed to its anticholinesterase property.[20]

Hormone Activity

The results of a 2017 *in vivo* study indicate that in comparison with standard treatment i.e. levothyroxine (a manufactured form of the thyroid hormone thyroxine), crateva showed stimulatory effects on the thyroid gland which was evident from raised free thyroxine levels and decreased thyroid stimulating hormone levels along with significant reduction in cholesterol levels, suggesting it has a beneficial role in treating hypothyroidism.[21.]

Antibacterial Activity

In vitro studies showed that crateva has antibacterial activity against strains that cause urinary tract infection including *Escherichia coli, Klebsiella sp. and Pseudomonas sp.*[22]

Indications

- Urinary system disorders including:
  - chronic and acute urinary tract infections
  - incontinence
  - bedwetting
  - prevention and treatment of kidney, bladder and urinary stones
- Benign prostatic hyperplasia (BPH)

Energetics

Hot and bitter with a sharp sweet taste.

Use in Pregnancy

Not recommended without professional advice due to its traditional use as a contraceptive and *in vivo* antifertility activity, however the relevance of this in humans is unknown. The ethanol and aqueous extracts of crateva have been found to possess significant anti-fertility effects in rats where it was effective in preventing pregnancy. Both extracts exhibited partial and complete resorption of implants at 300 and 600mg/kg dose levels, respectively. In an oestrogenic activity study both the extracts increased uterine weight in immature rats. The loss of implantation caused by ethanol and aqueous extracts may be due to antizygotic, blastocytotoxicity or anti-implantation activity. It is well known that for implantation exact equilibrium of oestrogen and progesterone is essential and any disturbance in the level of these hormones may cause infertility.[23]

Contraindications

None known.

Drug Interactions

None known.

Administration and Dosage

Liquid Extract:	1:2
Alcohol:	40%
Weekly Dosage:[24]	30 to 100mL

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