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## REVIEW ARTICLE

### Review on *Hybanthus Enneaspermus*

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#### ABSTRACT

Medicinal plants, medicinal herbs, or simply herbs have been identified and used from prehistoric times. Plants make many chemical compounds for biological functions, including defense against insects, fungi and herbivorous mammals. Over 12,000 active compounds are known to science. *Hybanthus enneaspermus* Linn F. Muell (Violaceae) is a herb or a shrub distributed in the tropical and subtropical regions of world and occurs mostly in the warmer parts of India. The deficiency & excess of essential micronutrients and trace toxic metals can cause serious effects on health. The plant is popularly known as Ratanpurus (Hindi) and Orithal thaamarai (Tamil). Traditionally the plant is used as anaphrodisiac, demulcent, tonic, diuretic, in urinary infections, diarrhea, cholera, leucorrhoea, gonorrhoea, dysuria, inflammation and sterility. The plant has also been reported to have anti-inflammatory, antitussive, antiplasmodia I, antimicrobial, and anticonvulsant activity. Plants alter the elemental distribution and metal accumulation to a large extent without toxic effects in response to environmental stress.

**Keywords:** *Ionidium enneaspermum*, *Ionidium suffruticosum*, Ladies slipper, Orithal thamarai, Pharmacological studies, phytochemical screening, Spade flower.

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### 1. Introduction

A medicinal plant is a plant that is used to attempt to maintain health, to be administered for a specific condition, or both, whether in modern medicine or in traditional medicine. The Food and Agriculture Organization estimated in 2002 that over 50,000 medicinal plants are

used across the world. The Royal Botanic Gardens, Kew more conservatively estimated in 2016 that 17,810 plant species have a medicinal use, out of some 30,000 plants for which a use of any kind is documented. The World Health Organization estimates, without reliable data, that some 80

percent of the world's population depends mainly on traditional medicine (including but not limited to plants) perhaps some two billion people are largely reliant on medicinal plants. The use of plant-based materials including herbal or natural health products with supposed health benefits, is increasing in developed countries. This brings attendant risks of toxicity and other effects on human health, despite the safe image of herbal remedies. Herbal medicines have been in use since long before modern medicine existed; there was and often still is little or no knowledge of the pharmacological basis of their actions, if any, or of their safety.

## 2. Plant Description

*Hybanthus enneaspermus* Muell, belonging to family Violaceae, is a herb or under shrub distributed in the tropical and subtropical regions of the world. It is a herb, often with woody troches, found in the warmer parts of India. The plant is used in case of pregnant and parturient women, and in case of gonorrhoea and urinary infections. The flowers are obtained in violet, pink and white in colour. The present study is intended to determine the antibacterial activity of the plant against selected urinary tract pathogens and compare it with eight standard drugs frequently used in the treatment of urinary tract infections.

### Traditional Uses:

This herb is considered to be extremely beneficial to men, used as a diuretic, demulcent and tonic. The root is diuretic and is used in urinary affections and bowel complaints of children. Decoction of leaves and tender stalks is demulcent. The fruit is used to treat scorpion sting. It is a hard task to collect adequate quantities of whole plants, let alone individual parts. The leaves are used for the preparation of a remedy for irregular bowel movement. The plant is used to garnish food of pregnant women, especially before childbirth and after delivery as a general tonic. It is a common ingredient in yoruba agbo for young children.

In traditional medicines, the whole plant is considered to possess tonic, diuretic and demulcent properties. A decoction of the leaves and tender branches is used to soothe the skin, and these parts of the plant are also made into a cooling liniment for the head. Dried powdered leaves are used to treat asthma. The root is diuretic, and is also administered as an infusion to treat gonorrhoea and infections of the urinary tract; it is also used to treat bowel complaints in children.

### Botanical Description and Vernacular Names:

Botanical name : *Hybanthus Enneaspermus* Linn.F. Muell

Family : Violaceae

Synonyms : Ionidium enneaspermum, Ionidium suffruticosum, Viola suffruticosa L.

**Tamil** : Orithal Thaamarai.

**Malayalam** : Nelam-parenda, orilattamara

**Sanskrit** : Padmacarini, charati

**Marathi** : Rathanparas.

**Kannada**: Charaata, purusharatna

**English** : Spade flower, Ladies slipper.

**Hindi** : Ratan Purush

**Bengali** : Munbora.

**Distribution**: Sri Lanka, India, China, Madagascar, Africa and Tropical Australia.



Fig 1: *Hybanthus enneaspermus*

### Phytochemical Screening:

Presence of triterpenes, steroids, sugars, alkaloids, phenols, flavones, catechins, tannins, anthraquinones and aminoacids were reported in this plant. The methanol extract showed the presence of steroids, sugars, alkaloids, phenols, flavones, catechins, tannins, anthraquinones and aminoacids. Benzene and chloroform extracts showed the presence of steroids. Petroleum ether extracts showed the presence of steroids and triterpenoids and water extracts showed the presence of sugars, alkaloids, phenols, flavones, tannins, anthraquinones and aminoacids.

## 3. Pharmacological Studies

### Antimicrobial Properties:

The antimicrobial property of medicinal plant *hybanthus enneaspermus* against two gram positive bacteria, viz. *Staphylococcus aureus* and *Bacillus subtilis* and five gram negative bacteria, viz. *Salmonella typhi*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Enterobacter pyrogens*, *Citrobacter freundii*. Two active fractions were isolated from benzene extract of plant.

### Antioxidant Properties:

Different fractions of *H. enneaspermus* were tested for total phenolic content, and in vitro antioxidant activity was measured by total antioxidant assay, DPPH assay, reducing power, Nitric oxide (NO), Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>) scavenging assays. The ethyl acetate (EA) fraction was found to have high levels of phenolic content. The EA fraction exhibited higher total antioxidant capacity, higher percentage of DPPH radical scavenging activity, nitric oxide, hydrogen peroxide, deoxyribose and higher reducing power. There was a significant correlation between total phenolic content and total antioxidant activity.

### Nephroprotective Activity:

In the present investigation, the ethanol and aqueous extracts of *Hybanthus enneaspermus* were studied for its nephron protective activity in cisplatin induced renal injury in rats. The extracts at dose levels of 250 and 500 mg/kg showed dose-dependent reduction in the elevated blood

urea and serum creatinine. The results suggest that the alcoholic and aqueous extracts of the *Hybanthus enneaspermus* possess significant curative and preventive nephron protective activity.

#### Free Radical Scavenging Activity:

Treatment with the alcoholic and aqueous extracts of *Hybanthus enneaspermus* increased GSH, GST and SOD level and inhibited the lipid peroxidation induced by cisplatin in the kidney homogenate. Cisplatin administration resulted in increased blood urea and serum creatinine levels which were reversed by the alcoholic and aqueous extracts of *Hybanthus enneaspermus*. The alcoholic and aqueous extracts showed significant free radical scavenging effect on DPPH, ABTS, Super oxide, Nitric oxide, and TBARS and Ferric ion free radicals.

#### Anti-nociceptive Effect:

In this study clearly showed that *Hybanthus enneaspermus* leaf ethanolic extract (EEHE) possesses anti-nociceptive activity. In both the tail flick and the formalin test, the extract was effective in reducing nociception in rats. The 500mg/kg of EEHE had anti-nociceptive effect comparable to that of acetaminophen as evident from the insignificant difference in the change in the latency period, and in the early and late phase formalin score in both groups. To validate the claim of the traditional birth attendants that *Hybanthus enneaspermus* leaf reduces labour associated pain, further studies are needed on the antinociceptive effect of the extract in non-pregnant and pregnant female rats.

#### Anticonvulsant Properties:

Anticonvulsant activity of aqueous and ethanolic extract of *Hybanthus enneaspermus* was studied using Maximum Electric Shock (MES) Method and Strychnine Induced Convulsion models. AQHE at the doses of 200mg/kg and 400mg/kg orally showed significant protection in both models. The activity was equipotent to phenobarbitone sodium. Ethanolic extract did not show protection.

#### Anti-Arthritic Potential:

The effect of alcoholic and aqueous extracts of the whole plant of *Hybanthus enneaspermus* Muell (Violaceae) on Freund's adjuvant induced arthritis. Both the extracts significantly ( $p < 0.001$ ) decrease the paw thickness at the end of 30 days treatment. Though in acute phase inflammation both of them show the same potency in chronic phase alcoholic extract exhibit more potency than the aqueous extracts. At the end of the studies the alcoholic extract shows more pronounced effect (59.4%) as comparable to aqueous extract (57.4%). The aqueous and alcoholic extract of *H. Enneaspermus* possesses potentially useful antiarthritic activity since it gives a positive result in controlling inflammation in adjuvant induced arthritic model in rats.

#### Aphrodisiac Activity:

The ethanol and aqueous extracts of *Hybanthus enneaspermus* (L.) F. Muell were evaluated for its aphrodisiac activity in sexually inactive male rats both in a single dose regimen and in a chronic regimen as a daily dose for 28 days. The aqueous extract produced a decrease in the mounting and intromission latency, with an increase in the ejaculatory and intromission frequency. In the chronic

model, both the alcohol and aqueous extracts increased the number of mounts, ejaculations and intromissions with decrease in the mounting and intromission latency. Treatment with aqueous extract also elevated the testosterone levels in sexually inactive male rats. The findings suggest that *H. enneaspermus* may exert aphrodisiac activity in sexually inactive male rats.

## 4. Conclusion

The survey of literature revealed that the *Hybanthus enneaspermus* (Linn.) F. Muell. having effective pharmacological activities such as antimicrobial, Aphrodisiac activity, free radical scavenging activity, antioxidant, anticonvulsant, anti-nociceptive, anti-arthritic. The results from this review are quite promising for the use of *S. trilobatum* as a multi-purpose medicinal agent, while *H. Enneaspermus* has been used successfully in Siddha medicine for centuries, more clinical trials should be conducted to support its therapeutic use. Moreover, the therapeutic potential of the plant should also be checked when used in combination with other herbal drugs.

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