

**INTERNATIONAL JOURNAL OF UNIVERSAL
PHARMACY AND BIO SCIENCES**

IMPACT FACTOR 4.018***

ICV 6.16***

Pharmaceutical Sciences

Review Article.....!!!

MUSUMUSUKKAI AND ITS MIRACULOUS USES**S. Elizabeth Benita^{1*}, Sripadh Ramachandran², A. Maheshwaran³ and S. Esther Benita⁴**^{1*}Pharm D, 4th year, Jaya college of pharmacy, Tamil Nadu, India.²Biomedical engineering 3rd year, S.t. peters university, Tamilnadu, India.³Principal, Jaya college of pharmacy, Tamil Nadu, India.⁴Dialysis technologist 2nd year, Madras medical mission, Tamil Nadu, India.**KEYWORDS:*****Mukia maderaspatana*,**

taxonomy, traditional medicine,

climbing vine, antioxidant,

magical property, essential

amino acids, flavanoids,

quercetin, silver nanotechnology.

FOR CORRESPONDENCE:**S. Elizabeth Benita *****ADDRESS:**Pharm D, 4th year, Jaya college
of pharmacy, Tamil Nadu, India.**ABSTRACT**

Herbal medicines are famous for its least side effects and they are easily accepted worldwide for its proven medicinal activity and was used by almost every aged people. They are proven as the best treatment option for the chronic diseased conditions like cancer, skin infections, and other critical medical condition. *Mukia maderaspatana* (Linn.) was a wild food plant belongs to the species of cucurbitaceae. which was generally found along the road sides of India and throughout indomalaya and maganesia. It was traditionally used world wide by various community of population for human consumption for its miraculous medical property.

INTRODUCTION:

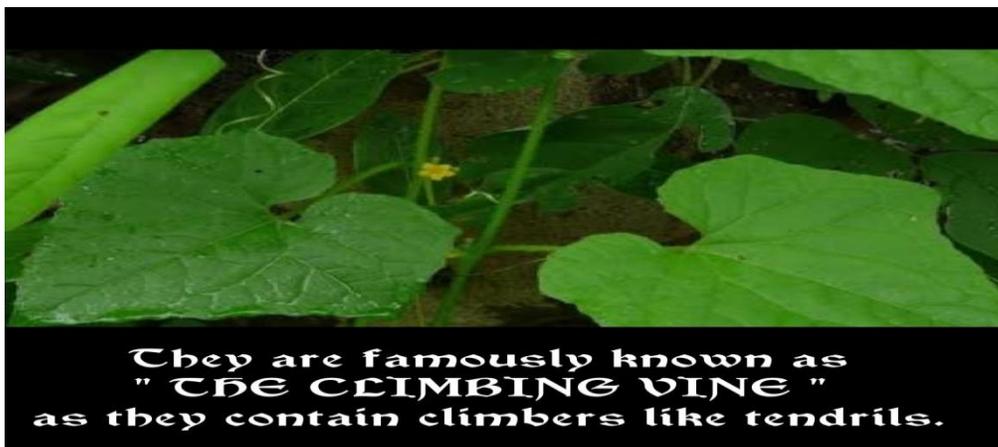
Nature origin in the from plant source was a gift to human race given by the mother nature. Plant origin have notably played important role in the ancient medicine by providing the desired therapeutic effect with least side effects. Recent trend in allopathic medicine claims instant cure to ailments when compared to traditional herbal use of plant based medicines. But in last few years there was a drastic increase in the usage of allopathic medicine even for the simple complications. Allopathic drugs cause major side effect such as hepatotoxicity, drowsiness, internal bleeding etc. Minor side effect such as nausea, vomit, headache, dry mouth etc. Still, recent evidence from the pharmaceutical industries proved that for specific ailments natural products are used preferred over allopathic form of drugs. Nature crude product represent s a valuable source for the production of synthetic drugs¹. Current survey proved that, in many developed and in developing countries 80 % of the population were started to rely on the traditional medicine to meet their primary health needs. Use of some medicinal plants were listed in indigenous system such as Siddha (600 sp), Ayurveda (700 sp), Amchi (600 sp), and unani “(700 sp)². The traditional communities use 7,000-7,500 plants for curing different diseases³⁻⁶.

DESCRIPTION:

- ❖ It was not forested.
- ❖ It is a annual trailing herb.
- ❖ It was about 4 metre long of open.
- ❖ Tiny hair like structures are found all over the plant.

OCCURANCE:

- ❖ It is a prostate annual herb known as “**CLIMBING VINE**”.
- ❖ Generally, it was found along with the white hair.
- ❖ They are most commonly found in New Zealand, Malaysia, Taiwan, Africa and China.

**FIGURE NO: 1**

DISTRIBUTION:

- ❖ Their distribution was reported to be semi-evergreen, deciduous and found along the region of sub tropic to topic region.
- ❖ In India, they are found along the roadsides, rail sides.
- ❖ It was widely found throughout west African region.
- ❖ They are widespread in the regions of tropical Africa, Asia, and in Australia.



FIGURE NO: 2

TAXONOMY:

Taxonomical details of *Mukia maderaspatana* was given below,

- ❖ **KINGDOM:** Plantae
- ❖ **DIVISION:** Sermatophyta
- ❖ **SUB-DIVISION:** Angiospermae
- ❖ **(UNRANKED):** Eudicots
- ❖ **(UNRANKED):** rosids
- ❖ **PHYLUM:** Tracheophyte
- ❖ **CLASS:** Magnoliopsida
- ❖ **SUB-CLASS:** polypetalae
- ❖ **SERIES:** calyiflorae
- ❖ **ORDER:** Violales
- ❖ **FAMILY:** cucurbitaceae
- ❖ **GENUS:** Mukia
- ❖ **SPECIES:** *M.maderaspatana*

BINOMIAL NAME:*Mukia maderaspatana***SYNONYMS:***Cucumis maderaspatanus L.***NOMENCLATURE:**

Mukia maderaspatana (Linnaeus) M.Roemer, (family : Cucurbitaceae) syn.: *Cucumis maderaspatanus L.*; *Melathria maderaspatana (L.) Cogniaux*; *Bryonia cordifolia L.*; *Coccinia cordifolia (L.) Cogn.*; *Bryonia scabrella L. f.*; *Mukia scabrella (L.) Kurz*; *M. Maderaspatana (L.) M. Roem. var. Scabrella (L.) Kurz*; *M. maderaspatana var. Gracilis Kurz* *Bryonia rottleri Spreng.*; *Mukia rottleri (Spreng.) M. Roem. var. Scabrella (L.) Kurz*; *M. Maderaspatana var. Gracilis Kurz* *Bryonia rottleri Spreng.*; *Mukia rottleri (Spreng.) M. Roem.*; *Bryonia althaeoides Seringe*; *Mukia althaeoides (Seringe) M. Roemer*; *Melothria althaeoides (Ser.) Nakai*; *M. Celebica Cogn. Var. Villosior Cogn.*; *M. Leiosperma auct. Non (Wight & Arn0*; *Cucumis maderaspatana (L.)*; *C. pubescens Willd*⁷⁻²³.

IDENTIFICATION OF MUSUMUSUKKAI³¹⁻³² :

The plant can be identified by the following characteristics

LEAVES:

- ❖ Leaves are Symmetrical.
- ❖ Ovate leaves.
- ❖ Anular.
- ❖ 3-5 lobed and 3-9 cm long.

FLOWERS:

- ❖ Flowers are 1 cm across.
- ❖ Axillary.
- ❖ sessile clusters.

CALYX:

- ❖ calyx tube 2 mm long.

VILLOUS :

- ❖ lobes subulate,
- ❖ Erect.

PETALS:

- ❖ 5, c.3 mm long.

OVATE:

- ❖ oblong,
- ❖ Obtuse,
- ❖ Yellow.

STAMENS:

- ❖ 3, free,
- ❖ Inserted the base of the calyx tube.

ANTHERS:

- ❖ ciliate.

SEEDS:

- ❖ lenticular.

FRUIT:

- ❖ Green turning orange and then to red as they mature.

HABIT:

- ❖ It was generally found in deciduous forest as a climber.

EDIBLE PARTS (world wide) :

- ❖ Fruits.
- ❖ Leaves.
- ❖ Tender.
- ❖ shoots.

FAMOUS TYPE OF CONSUMPTION:

- ❖ Decoction,
- ❖ Dry powder,
- ❖ Fruit,
- ❖ Seed.

HARVESTING AND PREPARATION:

- ❖ They are collected directly from the wild.

SEASON OF HARVESTING :**FLOWERING :**

- ❖ Around the month of July to September.

FRUITING:

- ❖ From the month of June.

STORAGE METHODOLOGY:

- ❖ Directly from the site of cultivation.



FIGURE NO: 3



FIGURE NO: 4

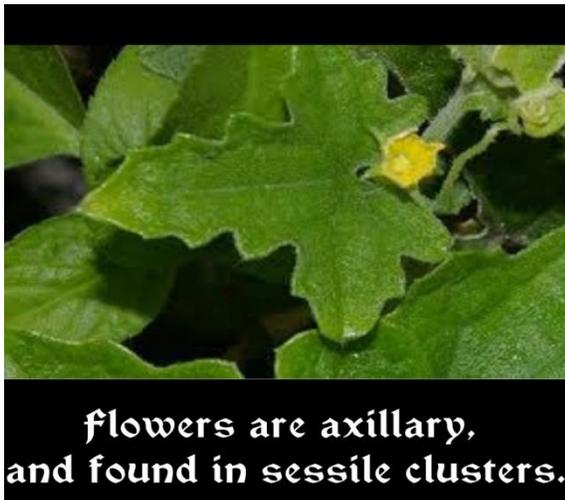


FIGURE NO: 5



FIGURE NO: 6

COMMON AND LOCAL NAMES:

The *Mukia maderaspatana* was notably called by various names based on its location of origin and locality of its occurrence.

| Language | Common/ Local names |
|------------|--|
| English | Madras pea pumpkin; Bristly bryony; Rough bryony; Wild cucurbit |
| Burmese | Sathakhiva; Thabwothkha |
| Chinese | Hong gua; Mao er gua; Mao hua ma jiao er |
| Filipino | Melon-gubat |
| Hausa | Gautan zomo; Malami; Malami na mata |
| Japanese | Sango ju suzume uri |
| Mundari | Huringkaubutuki; Japaputus; Jhajinari Kauasangga; Kaubutuki; Merommed |
| Nepalese | Matyangre kankri; Sunkeshre laharo; Ladbhadi; Nagilangiai |
| Sindhi | Bellari; Chirati |
| Sinhala | Gon-kekiri; Heen-kekiri syn. Hinkekiri Kekiri; Lene-kekiri syn. Lenkekiri |
| Tagalog | Melon-gubat |
| Thai | Taeng nok; Taeng nu; Taeng phi pluk; Taeng nu khon; Taneng nuu |
| Urdu | Musmusa; Chibbher; Chibhari Wal; Chirati |
| Vietnamese | Cau qua an; Cau qua nham |
| Bengali | Agmuki; Bilari; Patilalau |
| Gujarati | Chanak-chibhdi; Tindori |
| Hindi | Aganaki; Agumaki; Ankh-Phod; Ankh phutani bel; Aunkharo; Bilari; Gulya kakri; Laghumukhi; Musmusa; Paripushkara; Pindila; Setu |
| Kannada | Chitrati; Kaadu paavate balli; Mani toned syn.Mani tonde; Mani thonde syn,Manidonde; Sanna hindele kaayi |
| Konkani | Chirati |

| | |
|---------------------|--|
| Kaoni | Agumarki; Bilari; Gwalakakri |
| Malayalam | Aattanga; Chitrati; Mukkapeeram syn. Mukkapiram; Mukkalpeeram; Mukkaalpiram; Mukkapeeram; Mucca-pin; Mukkappiri; Mushumushka |
| Manipuri | Lam-thabi |
| Marathi | Bilavi; Chiraati; Ghugri; Kharwad; Meka Ringana vaela |
| Punjabi | Gwala kakri |
| Rajasthani | Ankh-Plutani ki bel |
| Sanskrit | Ahilaykhan; Ghantaali; Kritarandra; Krtarandhrah; Musimusikkayi; Paripushkara; Pindila; Setu; Trikoshaki |
| Tamil | Musumusukkai; Mochumochukkai; Muchumuchukkai; Aayilaiyam; Bommusutai; Cempucattumuli; cunaikkoti; Elavalukam; Kattumucukkai; Kattuvellari; Maamooli; Nagilangiai; Paripuskarai |
| Telugu | Budama dosa; Chedupulla; Kutaru budama; Kuturu budam; Lingadonda; Musumusukaya; Nugudosa syn.Noogudosa; Potti budamu; Putribudinga |
| Tulu | Baana koralu; Mukkattere |
| Trade name | Gwala Kakri |
| Bariba | Kobion |
| Pulaar and Fulfulde | Pomey |
| Banda | Akaya |
| Manja | Nya chindo |
| Swahili | Murhalagala |

NATURAL PRODUCTS VERSUS SYNTHETIC DRUGS:

Most of the essential nutrients required by the human body for its basic to vital function was absorbed in the form of nutrients from the food what we intake in our day to life. The naturally occurring plant product contains phyllo and phyto constituents found entrapped within them

making musumusukkai riched with nurients. They are famously known for its pharmacokinetic profile which include the process of metabolism and excretion process in the gut. In other hand the synthetic drugs provide instant relief compared to natural products but they have severe side effects which may cost the life of the patient. Still, there was a huge difference found in between their pharmacological profile . On comparing the side effects between the both. Natural products showed decreased side effect than synthetic form of drugs.

FOCUS ON PLANT INDUSTRY:

Today's world is moving towards the effective and healthy lifestyle to prevent the hereditary diseases and other commonly occurring environmental diseases to lead a healthy life free from medication. The study of health-related edible plants are high in trend now a days. These medicinal plants are highly attracting the customers for their rich medicinal properties which is involved in the process of healing of the chronic disease via simple mechanism of providing nutrition. Nowadays peoples are mostly relying on the natural products found available in the market.

NUTRITIVE INFORMATION:

- ❖ Presence of amino acids, flavanoids and alkaloids are categorised as their nutritive value.

POWDERED FORMULATION OF MUSUMUSUKKAI:

- ❖ The powdered formulation was mixed well in a glass of water and advised to take twice a day after food.

TO AVOID (pharmacist intervention):

On medication with herbal drugs we should avoid the intake of following,

- ❖ sea foods eg: dried fish.
- ❖ grape juice,
- ❖ limit the intake of sugar and salt.
- ❖ Drink plenty of water to stay hydrated.
- ❖ Replace sugar with alternative healthy form of honey.
- ❖ Restrict the intake of carbohydrates and replace it with healthy form of proteirin-rich diet.



Powered formulation of musumusukkai.

USE of *Mukia maderaspatana*:

In India, the tender shoots and bitter leaves are used as an aperients for the treatment of vertigo and biliousness. Decoction of fruit is used to relieve flatulence²⁸.

In Nigeria, the decoction of young shoots²⁵ and leaves is used as an aperients in children, it is also used for oka a disease²⁴ in children head, decoction of seed were used to cause perspiration²⁹. The root is chewed to relieve tooth ache and facial neuralgia.

In Tanganyika, the leaf sap is used in wound dressing. Leaves were used in the treatment of burns. The saps were used for the treatment of amoebiasis, Dried powder leaves are used for the treatment of scabies³⁰ and plant ash along with castor oil is rubbed the temple region for curing the headache.

In Senegal, it is known for its famous “MAGICAL PROPERTIES” used as an antidote^{26,27}. The fruit is used as an vermifuge²⁷.

ESSENTIAL ACTIVITES OF *Mukia maderaspatana*³²⁻⁵⁰:

They were discussed below:

1. ANTI-OXIDANT ACTIVITY:

❖ Agents like saponins, flavonoids enhances the anti-oxidant activity.

2. ANXIOLYTIC ACTIVITY:

❖ The hydro-alcoholic extract was found to posses anxiolytic activity.

3. ANTI-HYPERTENSIVE ACTIVITY:

❖ They shows good lipid profile and fibrinogen level.

4. HYPOLIPIDEMIC ACTIVITY :

- ❖ Consumption of extract was proven to be effective in case of HYPERLIPIDEMIA.

5. ANTI-DIABETIC ACTIVITY:

- ❖ Presence of PHLOROGLUCINOL proven to inhibit the cycle of gluconogenesis.

SIGNIFICANT ROLE IN THE FIELD OF PHARAMACEUTICAL INDUSTRY^{31,32}:

They are widely been studied for its ANTI-MICROBIAL activity, ethanolic extract from the source of fresh plant was reported to have mild activity against K.pneumonia.

Petroleum extract and methanol extract from the source of fresh plant was reported to be active against S.aureus, B.subtilis, P.aeurginosa, and E.coli.

QUERCETIN, phloroglucinal extract of the whole plant was studied in the rat liver slices for inhibition of gluconrogenesis.

ANTI-MICROBIAL PROPERTY OF *Mukia maderaspatana*:

There was a increased risk of emergence towards the resistance of bacterial infections. Musumusukkai was well known for its anti-microbial and anti-bacterial activity due to the presence of components like lignans and cyclotides. These agents were used as antibacterial agent.

EFFECTIVENESS:

Mukia maderaspatana was found to be very effective against the organisms such as P.aeurginosa, E.coli, S, aureus... etc.

ROLE IN DEGENERATIVE DISEASE CONDITION:

They play a major role in the diseased of the following

- ❖ Alzheimer's disease,
- ❖ Atherosclerosis,
- ❖ Carcinogenesis,
- ❖ Pulmonary diseases,
- ❖ Haematological diseases..etc.

ETHNOBOTANICAL APPROACH :

The approach towards the selection of drug was been clearly identified and paved way for the discovery of the bioactive components from the crude drug plants.

ANTI-OXIDANT PROPERTY OF *Mukia maderaspatana*³³⁻³⁶:

Among the various medicinal plant found widely along the sides of India, musumusukkai possess the highest range of anti-oxidant property, ranging between 121.7 µg/g.

FACTORS INFLUENCING THE ANTI-OXIDANT PROPERTY:

Presence of certain naturally occurring plant chemicals like polyphenol and eugenol act as an reducing agent and involves in the process of inhibition of lipid peroxidation by exhibiting the anti-oxidant property.

MAJOR ANTI-OXIDANT USAGE OF *Mukia maderasapatana* WITH OTHER ALIMENT:

They are majorly used in the treatment of following

- ❖ Anthrax,
- ❖ Rabies,
- ❖ plague,
- ❖ madness in live stocks.... etc.

ADVANTAGES OF HERBAL DRUGS:

- ❖ Less ADR.
- ❖ Cost effective.
- ❖ Good pharmacological profile.
- ❖ They are easily available in the market.
- ❖ Wide availability of the drug formulations(eg: capsule, powder, gum, decoction...etc).

NANO TECHNOLOGY:

This is a interesting field, which is growing very faster in the field of research nowadays. They plays a significant role in the field of medicine by synthesising nano size drug particle (ranging around 80-90 nm) from the crude plant source.

SILVER NANO PARTICLE:

The biomass of several plant products were used in the synthesis of silver nano particle.

MEASURE OF ABSORBANCE:

The level of absorbance was measured using “**FOURIER TRANSFORM INFRARED SPECTROMETRY (FT 1-K)**” around the range of **4000** and **400 cm⁻¹**.

CONCLUSION:

Mother nature provides varies gifts to the human species by the source of its natural wealth. Peoples are educated well enough to choose the healthy way of living to improve their span of life. They are very cautious on what they have and what they do. Demand in the field of natural hold was being increased day by day. Preferring natural products will improve the quality of life.

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