



PUDINA (MENTHA): MENTHA ARVENSIS

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ABSTRACT

Since the beginning of life, plants have been vital for sustenance, shelter, and medicinal purposes. *Mentha arvensis* Linn., a member of the Lamiaceae family, serves as a household remedy, food seasoning, and for various industrial applications. Traditionally, it has been used for hypertension, ischemic heart disease, colds, fevers, digestive issues, and cardiovascular disorders. Its leaves possess therapeutic properties and aromatic fragrance, making them valuable for flavoring. *Mentha arvensis* is also utilized in treating liver disease, spleen disorders, asthma, and jaundice.

KEYWORDS: *Mentha arvensis*, Methanol, Antifertility activity, Pudina, Ayurveda.

INTRODUCTION

Plant-derived drugs, originating from the term "drogge," have been crucial in medicine for centuries.^[1] About 25% of drugs still come from plants^[2], with active compounds isolated from various parts.^[4,5] *Mentha arvensis* Linn., known as Japanese menthol mint, is globally used in medicinal formulations, notably for treating diarrhea, dysentery, and stomach issues.^[7,8] Its therapeutic properties are attributed to phytochemicals like

terpenoids and phenolics. Menthol, derived from *Mentha arvensis*, is widely used in pharmaceuticals, perfumery, and food industries.^[9] The plant exhibits diverse pharmacological activities, including antimicrobial and antioxidant effects.^[6] This review comprehensively explores *Mentha arvensis*, detailing its taxonomy, composition, traditional uses, and pharmacological activities (Table no. 1 and no. 2).



Figure: Mentha arvensis (pudina).

Table no 1: Vernacular names of Mentha arvensis linn.

English	Field mint, Japanese mint, Pennyroyal, Spearmint, Garden mint
Hindi	Ban Pudina, Paudina, Podina, Pudina, pudinah
Sanskrit	Pudina, putiha, podinika, phudino, podina
Arabic	Fodanaje, Fotanaje, Habaqulhind, Naanaaul-hind, Nana, Nana hindi, Nana yabani
Burmese	Bhudina
Canada	Chetni-muruga
Japan	Midorihakka

Nepal	Nawaghya
Kannada	Chetamargugu, chetni-marugu, chetnimaragu, chetnimaruga
Malayalam	Putina, putiina, puttityana
Marathi	Pudina

Table no 2: Taxonomical classification of Mentha arvensis linn.

Taxonomical Rank	Kingdom	Division	Class	Order	Family	Genus	Species
Taxon	Plantae	Magnoliophyta	Magnoliopsida	Lamiales	Lamiaceae	Mentha	Mentha arvensis

Botanical Description of Mentha arvensis

Mentha arvensis Linn. is classified under the Lamiaceae family. This herbaceous perennial plant exhibits an erect growth habit, reaching a height of 20-80cm, with square, hairy stems. The flowers are arranged in whorls around the upper leaf axils, measuring 4-7mm in length, displaying a 2-lipped, irregular structure that undergoes a color transition from white to pink to violet. Notably, the stamens are longer than the petals. The fruits of Mentha arvensis Linn. manifest as brown nutlets.^[10,11]

Geographical Distribution of Mentha arvensis

Mentha arvensis Linn. is distributed in Eurasia, thriving particularly in subtropical regions. This plant is found around the North Pole and extends its range as far south as New Mexico. Its native habitats encompass regions in Europe, as well as western and central Asia.^[12]

Phytochemical Constituents of Mentha arvensis

The chemical composition of Mentha arvensis includes α -menthol, neomenthol, isomenthol, d-menthone, isomenthone, menthofuran, menthylacetate, carvomenthone, cineol, p-cymene, aromadendrene, limonine, -phellandrene, pipertone, -pinene, carvacrol, α -pinene, α -phellandrene, -pinene, dipentene, cardinene, and thujone, varying based on factors like season, climate, and processing.^[13,14] Flavonoids such as quercetin, isorhoifolin, menthoside, vitamin K, thymol, and eugenol are also present.^[15]

Table no. 3: Rasa Panchak of Mentha arvensis linn. (Pudina)

Sanskrit/English	Sanskrit/English
Rasa/Taste	Katu/ Bitter /Pungent
Virya/Potency	Ushan/Hot
Vipaka/Metabolic Property	Katu/
Guna/Physical Property	Laghu, Ruksha, Tikshan/ light, Dry, Pungent

B. Folk View

In New Zealand, mint serves as a tonic and is used to treat colds, flu, headaches, colic, gas, and nausea. Mint oil is applied to burns to relieve pain and is consumed regularly to dissolve gallstones. In India, mint is employed to tone the stomach, stimulate the mind and body, alleviate gas in the intestines, and relieve muscle spasms. Additionally, mint chutney is utilized as a medicinal herb. The Arab culture also values mint for various ailments, including skin diseases. They view mint as a tonic for both the mind and the stomach, highlighting its multifaceted applications in promoting well-being.^[24]

Majak and Neil et al. isolated phenolic esters from Mentha arvensis, identifying caffeic acid and p-coumaric acid.^[16] Acylated anthocyanins were found in acetone powders.^[17] Constituents isolated from suckers included 3-O- β -sitosterol-glucopyranosyl-(1 α -2) fructofuranoside and sucrose, while linarin was found in the flowers. Essential oil yields vary by plant part, with shoot leaf having the highest yield. Menthofuran was detected in oils from various regions.^[18] Menthofuran was detected in oils from various regions.^[19] Lipid contents were 6.2% and 2.0% in leaves and stems, respectively, with major fatty acids including linoleic and palmitic acids. Pigments were major components among non-polar lipids.^[20,21]

TRADITIONAL AND MODERN VIEW

A. Ayurvedic View

Mentha arvensis Linn., known as "Pudina or Putiha" in Ayurveda, is a medicinal herb with a cooling effect, aiding digestion, alleviating colic pain, and treating worms. It's rich in vitamins and antioxidants, promoting skin health, immunity, and brain function. Mint leaves stimulate digestion, ease inflammation, and relieve nausea. They also improve oral health and are used in dental products. Further details on its properties are in Table 3.^[22,23]

C. Modern View

In the contemporary global herbal drug industry, a major concern is the widespread practice of adulteration, which has significantly eroded trust in herbal drugs.^[25,30] Adulteration takes various forms, including substituting standard varieties with inferior drugs or toxic materials, leading to the degradation of drug quality.^[31,33] This practice not only increases drug costs but also introduces adverse effects.^[34,35]

Mint, for instance, is used in various products for its flavor and cooling effect. Pakistan imports menthol

components for use in soaps, detergents, cosmetics, perfumes, toothpaste, and other industrial products.^[36]

REPORTED THERAPEUTIC AND PHARMACOLOGICAL STUDIES OF MENTHA ARVENSIS

Research on *Mentha arvensis* has been undertaken to explore its therapeutic and pharmacological applications. While existing studies provide valuable insights, there is a call for large-scale scientific investigations to substantiate the clinical efficacy of this herb, particularly in the domains of skin diseases, immunomodulatory disorders, and anti-peptic properties.

1. Antibacterial Activities

Imai et al. conducted a study on the antibacterial activity of essential oils derived from *Mentha arvensis*. The essential oils demonstrated efficacy against various bacteria, including *Helicobacter pylori*, *Salmonella enteritidis*, *Escherichia coli*, *Staphylococcus aureus*, and methicillin-resistant *Staphylococcus aureus* (MRSA). The antibacterial activities exhibited variations among the tested bacterial species, but they were comparable between antibiotic-resistant and antibiotic-sensitive strains of both *H. pylori* and *S. aureus*.^[37]

2. Antioxidant Activities

Santos et al. examined the antioxidant activity of cineole extracted from *Mentha arvensis*, particularly its impact on ethanol-induced gastric mucosal damage in rats. Their findings indicate that cineole extract possesses antioxidant properties.^[38] Furthermore, flavonoids like quercetin found in mint have been reported to exhibit antioxidant activity by scavenging hydroxyl and superoxide free radicals and inhibiting lipid peroxidation.^[39,40]

In a study by Kong et al., the antioxidant potential of extracts containing eugenol, terpenes, and flavonoids from *Mentha arvensis* leaves was investigated, demonstrating significant antioxidant activity.^[41]

3. Antifertility Activities

Sharma et al. conducted a study on the antifertility activity of the petroleum ether extract derived from the leaves of *Mentha arvensis* in male albino mice. The extract was orally administered at doses of 10 and 20mg/day/mouse for 60 days. Results indicated that the petroleum ether extract possesses reversible antifertility effects in male mice.^[42]

Sharma et al. studied the reversible contraceptive effects of *Mentha arvensis* leaf methanol extract in male albino mice. They administered the extract orally for 20, 40, and 60 days. As treatment duration increased, testis and accessory reproductive organ weights decreased, along with decreased sperm concentration, motility, and viability in the cauda epididymis.^[43]

CONCLUSION

Mentha arvensis, commonly known as Pudina, is a widely utilized flavoring agent in a variety of culinary applications, including meat, fish, sauces, soups, ice-creams, stews, vinegar, teas, tobacco, and cordials. Beyond its culinary uses, *Mentha arvensis* has been recognized as a therapeutic plant with a history of treating various ailments. This plant is a rich source of diverse chemical constituents, including but not limited to α -menthol, neomenthol, isomenthol, d-menthone, isomenthone, menthofuran, menthylacetate, carvomenthone, cineol, p-cymene, aromadendrene, limonine, -phellandrene, pipertone, -pinene, carvacrol, α -pinene, α -phellandrene, -pinene, dipentene, cardinene, thujone, and many others.

CONFLICT OF INTEREST

Declared none.

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