

**EFFICACY OF MELISSA OFFICINALIS (BADRANJBOYA) AN IMPORTANT DRUG IN UNANI SYSTEM OF MEDICINE- A REVIEW ARTICLE****Mohammad Danish<sup>1\*</sup>, Seemab Alam<sup>2</sup>, Swaleha Khan<sup>3</sup>, Kahkashan Baig<sup>4</sup> and K. Lalitha<sup>5</sup>**<sup>\*1,2</sup>Assistant Professor, Dept. of Moalajat (Medicine), Inamdar Unani Medical College & Hospital, Kalaburagi.<sup>3</sup>Professor & HoD, Dept. of Ilmu Jarahat (Surgery), Inamdar Unani Medical College & Hospital, Kalaburagi.<sup>4</sup>Assistant Professor, Dept. of Amraz-e-Niswan wa Qabalat (Obstetrics & Gynecology), Inamdar Unani Medical College & Hospital, Kalaburagi.<sup>5</sup>Assistant Professor, Dept. of Ilmu Atfal (Pediatrics), Inamdar Unani Medical College & Hospital, Kalaburagi.**\*Corresponding Author: Dr. Mohammad Danish**

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**ABSTRACT**

Melissa officinalis L. is a medicinal plant that has long been used in different ethnomedical systems especially in the European Traditional Medicine and the Unani Traditional Medicine for the treatment of several diseases. It is also widely used as a vegetable and to add flavor to dishes. Aim of the review: This review aimed to provide a summary on the botanical characterization, traditional uses, phyto-chemistry, pharmacological activities, pharmacokinetics and toxicity of *M. officinalis*, and discusses research gaps and future opportunities for investigations on this plant. In “Mufarreh-ul-Quloob”, as mentioned by Ibn-Sina in his famous book “Risala Advia Qalbiya”. In Unani literature, a number of pharmacological effects of Badranjaboya are mentioned viz. Tonic for vital organs, exhilarant, sedative, hypo-cholesteremic, anti-inflammatory, deobstruent and useful especially in the obstructions in the brain caused by imbalanced or increased black bile (saoda). Due to its sedative property, the drug is also used in allergic conditions such as asthma, its efficacy is also reported in insomnia, anxiety and depression. Many cardiac diseases are closely related with personal behavior and emotions attitude wherein Badranjaboya produces promising results because of its efficacy in psychological disorders.

**KEYWORDS:** Badranjaboya, Mufarreh, Sauda, Cardio-protective effect.**I. Introduction of plant melissa officinalis**

*M. officinalis*, also known as lemon balm, common balm or sweet balm, is a perennial lemon-scented herb belonging to the Lamiaceae. According to “The Plant List” *Melissa officinalis* L. is the only accepted name for the plant, with nine synonyms including “*Melissa officinalis* subsp. *altissima* (Sm.) Arcang., *Melissa officinalis* var. *altissima* (Sm.) K.Koch, *Melissa*

*officinalis* var. *cordifolia* (Pers.) K.Koch, *Melissa officinalis* var. *foliosa* Briq., *Melissa officinalis* var. *graveolens* (Host) Nyman, *Melissa officinalis* var. *hirsuta* K. Koch, *Melissa officinalis* subsp. *officinalis*, *Melissa officinalis* var. *romana* (Mill.) Woodv. and *Melissa officinalis* var. *villosa* Benth.”. There is also an infraspecific taxon of the species *Melissa officinalis* L.: *Melissa officinalis* subsp. *inodora* Bornm.

**Fig. 01: Flowering Top and Leaves of melissa officinalis.**

*Melissa officinalis* grows to the height of 30–125 cm, with soft short hairs surrounding all parts. The stem is erect, branched, usually glabrous and quadrangular. Leaves are petiolate, ovate, to 6 cm long, 3 cm broad, the upper cuneate, the lower cordate at base, crenate-toothed, subglabrous, sometimes with glandular hairs or punctate glands beneath. Flowers are white or pale pink consisting of small clusters of 4–12 blossoms in the summer. It has two stamens and four lobed ovaries forming 1–4 nutlets. The seeds are very small about 1–1.5 mm long, with ovate dark brown or black color. Lemon balm can rapidly grow at a temperature range of 15–35 °C, and requires 500–600 mm precipitation well distributed throughout the growing season, otherwise it should be irrigated. *M. officinalis* has a hairy root system with many lateral roots, which makes the plant more adaptable to different environmental conditions. The upper parts of the plant die off at the start of winter but new shoots re-emerge from roots at the beginning of spring. *M. officinalis* grows worldwide but its origin has not been well defined. However, the Eastern Mediterranean region, Western Asia and Southern Europe, Caucasus and Northern Iran are considered as areas of origin.

In Indigenous System of Medicine particularly of Unani Medicine it is known as Badranjboya and is used to cure fever, sore throat and as cardiogenic as well.<sup>[1]</sup> Its extract is reported to lower the blood cholesterol level in animals.<sup>[2]</sup> Leaves are also chewed to relieve toothache. Badranjboya is composed by two words “Badranj” and “Boya”. Badranj is known as Turanj in Unani whereas Boya means fragrance. The name “Badranjboya” has been coined due to its fragrance which is like that of citron (Badranj, Utruj or Turanj); it smells like Utruj so called Badranjboya.<sup>[3]</sup>

## II. Cultivation of plant melissa officinalis

Lemon balm is widely cultivated in Europe and the United States, but also grows wild along paths and roadsides. The plants prefer sandy and loamy fertile soils, well drained and at pH range 5 to 7. It grows well in full sun, but it also grows in partial shade (Janina, 2003). When the plants grow in semi-shade, they produced largerleaves and habitat than those grown in sunny

condition. Lemon balm can rapidly grow at temperature range 15 to 35°C and requires 500 to 600 mm precipitation well distributed throughout the growing season, otherwise it should be irrigated. It is sensitive especially to drought in the establishment year. Once it develops a deep root system, its water requirement lessens (Davis, 1982). There exist three other subspecies which are naturally expended in our wild flora; subsp. *officinalis*, subsp. *altissima* and subsp. *inodora* (Davis, 1982).

## III. Distribution of plant melissa officinalis

It is reported that the plant is mainly grown in Germany, France, Italy, Romania, Bulgaria, and North America. (Anonymous, 2003) Ceylan, (1987 reported that the subspecies of *M. officinalis* are evaluated in domestic markets and they are also on the list of the exported medicinal and aromatic plants. It is used in traditional medicine from ancient times. French monks and nuns, and Paracelsus (1493 - 1541), Swiss physician and chemist, prepared tonics, called as “life elixir”, contain lemon balm, and used. English writer John Evelyn (1620- 1706), described this plant as “ruler of brain, strengthening to mental, and removing from melancholia”. Its essential oil was named “bal-smim” or “leader of the oils” in Hebrew. Avicenna recommends that lemon balm strengthened heart (Anonymous, 2003).

## IV. Chemical composition of plant melissa officinalis

Essential oil rate in drug herb changes between 0.02 to 0.30%, which is quite low compared to other member of the family labiatae. That is why the production cost and price of essential oil is very high in the market. Meftahizade *et al.* (2010), reported that the main constituent of the essential oil are citral (geranial and neral), citronellal, geraniol, beta-pinene, alpha-pinene, beta - caryophyllene, comprising 96% of the oil ingredients. Also carnat *et al.* (1998), reported the chemical composition of essential oil of lemon balm, and found that major components are citral representing 48% of the essential oil, followed by citronellal with 39.47% and caryophyllene with 2.37% in another investigation, the percentage of the main constitute found by Sarer and Kokdil, are follows: alpha-pinene (2.86%), beta-pinene (11.37%).

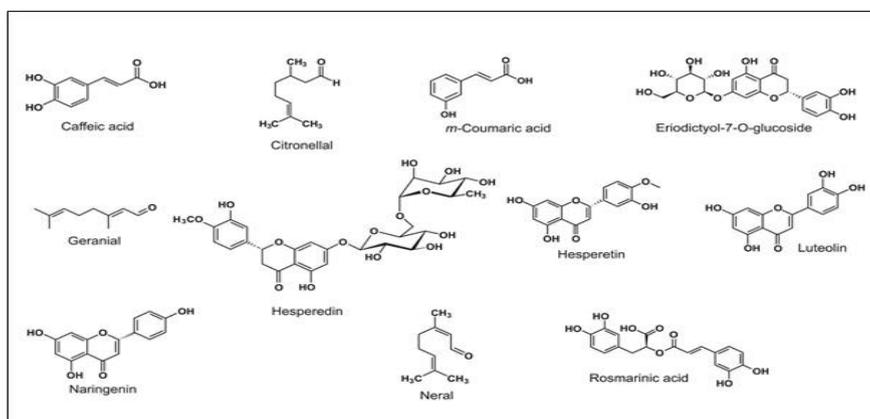
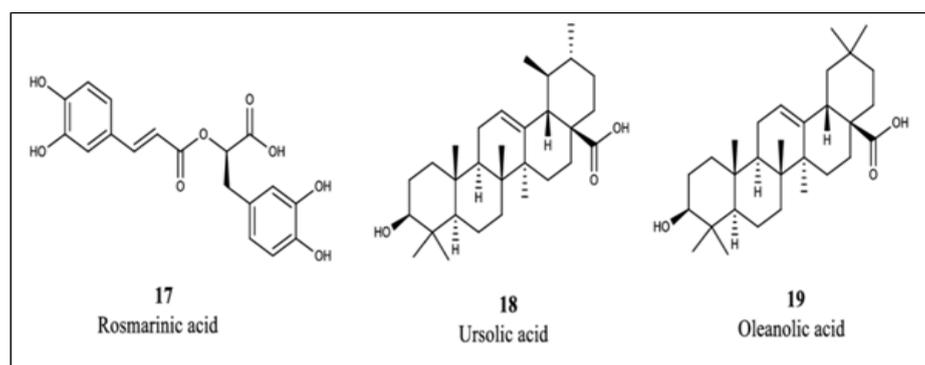


Fig. 02: Chemical constituents of melissa officinalis.

linalool (2.74%), citronella (5.86%) borneol (0.62%), neral (12.22%), and geraniol (38.13%), in addition, fresh herb of lemon balm contains total phenolic (2253 /100 mg), L-Ascorbic acid (53.2 /100 mg) and carotenoids (46.3 /100 mg), to complete this review of composition it is important to mention that several subspecies of *Melissa* are recognized which exhibit a very different chemical profile. The subspecies *altissima* produces oil mainly composed of beta- cubebene, terpinolene, gamma-3-carene, terpinene, bertacaryophyllene and muurolol (Dawson *et al.*, 1988). The subspecies *inodora*, which had been used in Turkish folk medicine, contains beta-cubebene, beta-caryophyllene, alpha-cadinol and geraniol and neral (7 and 6% respectively). Distinct

chemotypes of *M. officinalis* have not been found. The quantitative composition of the essential oil can vary. But qualitatively it is relative constant. Masakova *et al.* (1979) reported that the citral isomers geraniol and neral are the main component of *M. officinalis*. Caernat *et al.* (1998) reported that composition of essential oil of lemon balm are citral (neral + geraniol), representing 48% of the essential oil. Neral and BetaCaryophyllene was the main components in chemical analysis of essential oils from *M. officinalis* L. (meftahizade *et al.*, 2010). Concerning the characterization of the essential oil, several works studied the composition of the aerial flowering parts of *M. officinalis*.



**Fig. 03: Chemical composition of melissa officinalis.**

For instance, Acevedo *et al.* isolated the following essential oils: eugenol, caryophyllene,  $\alpha$ -caryophyllene, 3-methyl-4-isopropyl phenol, and germacrene D. Abdellatif *et al.* hydro distilled the dried leaves of *M. officinalis* and identified the following essential oils using gas chromatography coupled to mass spectrometry (GC-MS): 1-octen-3-ol, 6-methyl-5-hepten-2-one, myrcene, (Z)- and (E)- $\beta$ -ocimene, linalool, nonanal, trans-limonene oxide, camphor, citronellal, cis-chresontynol, menthol, isomenthol, nerol, neral, piperitone, geraniol, geraniol, dihydrocitronellol acetate,  $\alpha$ - and  $\beta$ -cubebene, geranyl acetate,  $\alpha$ -copaene,  $\beta$ -caryophyllene,  $\alpha$ -humulene, germacrene D, (E)- $\beta$ -ionone, valencene, (E)-nerolidol, caryophyllene oxide, 1-hexadecene, 14-hydroxy-9-epi-(E) caryophyllene, n-eicosane, n-heneicosane, methyl citronellate, and camphene. Barakat *et al.* identified the following compounds by hydrodistillation of dried leaves of *M. officinalis* using GC-MS: (E)-ocimene,  $\alpha$ -campholenal, pinocarvone, terpinen-4-ol, cumin aldehyde, thymol, p-mentha-1,4-diene-7-ol,  $\alpha$ -copaene,  $\beta$ -bourbonene, panasinsene, (E)-caryophellene, amorpho-4,11-diene,  $\gamma$ -muurolene, elemol, caryophellene oxide, humulene epoxide II, elemol acetate,  $\alpha$ -terpinolene, trans-pinocarveol, cis-chrysanthenol, (E)-citral, carvacrol, decadienal,  $\alpha$ -copaene,  $\beta$ -bourbonene, and isotorquatone. Efremov *et al.* extracted the essential oils by exhaustive water and steam distillation from the above-ground part of *M. officinalis*. Rehman *et al.* identified from *M. Officinalis* fresh leaves using the headspace solid-phase microextraction (HS-SPME)

coupled with GC-MS with the following compounds, all with interesting activity:  $\beta$ -pinene, artemiseole, 1-octen-3-ol, 3-octanol, 6-methyl-5-hepten-2-one, D-3-carene, (Z)- $\beta$ -ocimene, linalool, cis-rose oxide, trans-rose oxide, cis-verbenol, limonene oxide, citronellal, isopulegone, myrtenol, citronellol, geraniol, (Z)-citral, methyl geranate, (E)-citral, citronellyl acetate,  $\alpha$ -copaene, geranyl acetate,  $\beta$ -caryophyllene,  $\alpha$ -bergamotene,  $\alpha$ -humulene, germacrene D,  $\alpha$ -farnesene, and D-cadinene. In the perspective of an eco-friendly sustainable procedure, it is worth to mention the work of Khalili *et al.*, which reported the solvent-free extraction of essential oils from *M. officinalis*. The compounds identified by GC-MS are linalool, (Z)- and (E)-citral, neryl acetate,  $\beta$ -bourbonene,  $\beta$ -bourbonene,  $\alpha$ -humulene, germacrene D,  $\alpha$ -muurolene, and caryophyllene oxide.

#### V. Habitat and distribution of Badranjboya in India

The plant is widely distributed in the regions of temperate Himalayas from Garhwal to Sikkim, Darjeeling to Khasi, Aka and Mishmi hills, at an altitude of 1200-3000 meters.<sup>[8]</sup> Badranjboya is also found at Afghanistan,<sup>[13]</sup> Mediterranean Countries, Asia, Europe, and North America,<sup>[10]</sup> Foot of the Himalayas and Plains of North India,<sup>[5]</sup> Punjab, Upper Gangetic Plain, Bihar, West Bengal, Rajasthan, Deccan and Konkan.<sup>[4]</sup> Nepal Jhajra, Prem Nagar and Sahaspur.<sup>[14]</sup> Commercial cultivation is centered in southwestern, central and Eastern Europe.<sup>[15]</sup>

As far as the geographical location of Badranjboya is

concerned, many texts say that Badranjboya is abundant in Himalyan and Sub-Himalyan region, Sikkim, Jammu and Himachal Pradesh etc. and also found in wheat crop, but during the survey when the test drug was searched in the areas mentioned above, it caused a lot of problems and finding the exact plant became an uphill task. However, the fresh and original plant of Badranjboya (*Nepeta Hindostana*) was collected from Forest Research Institute (FRI) Dehradun then from Shankar Nagar a village of district Balrampur Uttar Pradrsh and also cultivated at herbal garden of department of Ilmul Adva.

#### VI. Mahiyat (Morphology and macroscopic features of badranjboya)

*N Hindostana* is an *Ocimum* like herbaceous plant,<sup>[3]</sup> annual, sub erect, slightly pubescent with middle size, velvety, 15-40 cm in height. Leaves petiole, ovate, obtuse, cremated, cordata at the base, pubescent on both sides, green or scarcely hairy, Racemes somewhat simple, Cymes dense, lower ones peduncled, Bracts subulate, outer ones equaling the calyx or a half shorter, branching from the base; branches are vertical or climbing, obtusely quadrangular, grooved, gently pubertal, almost floriferous throughout whole length. Mouth of the pubescent calyx oblique, teeth subulate, the upper ones longer, Corolla longer than the calyx, Nuts smooth or minutely granular, Flowers are purplish.<sup>[5]</sup> Ascending or Erect herb. Leaves broadly ovate or orbicular, Flowers blue purple. Fruits are nutlets.<sup>[4]</sup> Nutlets are brown with white spots.<sup>[13]</sup> *N. Hindostana* whole plant, leaves, flower and seeds continued bloom<sup>[16]</sup> Flowering nearly all the year<sup>[5]</sup> Easily grown in average, dry to medium, well-drained soil in full sun to part shade. Prefers cool, moist soils. Plants are not as drought tolerant as many of the other *Nepetas*. In northern areas, plant grows in full sun. In the Deep South, grows in areas with some light afternoon shade. Plants may be cut back before first flowering to promote more compact size. Shear flower spikes after initial flowering to promote Leaves are harvested 2 to 3 times in a year at flowering stage. From one Hectare of land around 2000 kg of dried leaves can be obtained per year.<sup>[17]</sup>

#### A. Dose of badranjboya

5-7 g. is recommended. As brain tonic low dose (2-3g) is useful, for sedative effect 3-5 g and for heart diseases high dose (7-10 g).<sup>[1, 3, 8]</sup>

#### B. Adverse effect of badranjboya

It is harmful for pulmonary diseases,<sup>[1,3]</sup> reduces blood plasma level of phenytoin.<sup>[19]</sup>

#### C. Correctives of badranjboya

Kundur (*Boswellia serrata* Roxb) and Samag Arabi (*Acacia arabica*) are used in the harm associated with *N. hindostana*.<sup>[1,3]</sup>

#### D. Substitute drugs of badranjboya

Aabresham (*Bombyx mori*) and Faranjamushk (*Ocimum gratissimum*) are an alternative of *N. hindostana*.<sup>[1,3]</sup>

#### E. Famous compound formulations of badranjboya

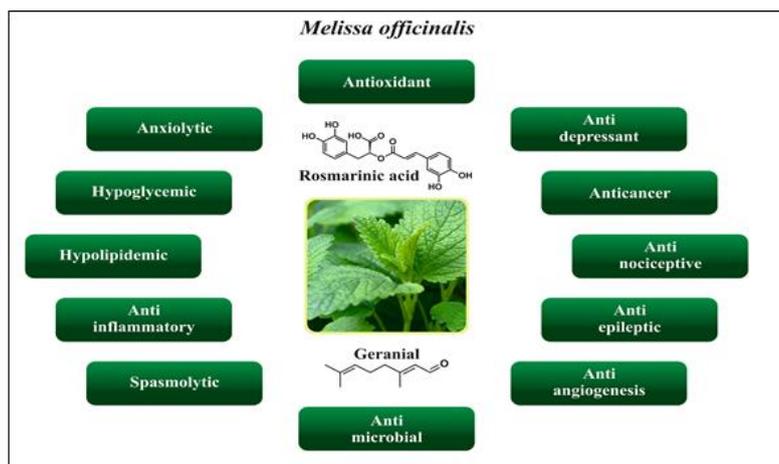
Badranjboya is used in various Khamirajat like Khamira Abresham Hakim Arshad Wala, Khamira Abresham Sheera Unnab Wala, Sharbat Ahmad Shahi, Majoon Seer Alwi Khan, Lipotab etc.<sup>[4, 20, 21]</sup>

#### VII. Pharmacological Actions and Therapeutic uses of badranjboya

The following actions have been described by different authors.

Mufarreh (Exhilarant), Muqawwi Qalb (Cardiotonic), Munzij (Concoctive), Musaffi dam (Blood Purifier), Muhallil (Resolvent), Musakkhin (Calorific).<sup>[1,3,22,23]</sup> Dafie Afsurdagi (Antidepressant), Dafii Tashannuj (Antispasmodic), Dafii Hikka (Antihistaminic), Qatil Verusiya (Anti-viral), Muaddil Khoon/Hormone (Blood alterative), Anti-thyroidal,<sup>[24]</sup> Kasir Riyah (Carminative), Muqawwi (Tonic), Qabiz (Astringent), Muharrik (Stimulant),<sup>[13]</sup> CNS depressant, Musakkin (Sedative),<sup>[9]</sup> Dafe Itehab (Anti-inflammatory),<sup>[4]</sup> Jaraseem Kush (Bactericidal) and Antifungal.<sup>[15]</sup>

The decoction of fresh leaves or dried leaves powder of Badranjboya is used in phlegmatic diseases (Amraz balghami) and Melancholia (Malankholiya), epilepsy (Sar'a) hemiplegia (Falij) facial paralysis (Laqwa) and cardiac diseases (Amraz Qalb).<sup>[1,25]</sup> Dried leaves powder is useful in arthritis (Wajaul Mafasil).<sup>[24]</sup> Its local application is beneficial in mastitis (Warm Sadiyen).<sup>[3,24,25,26]</sup> A decoction of the plant is used as a gargle for sore throat, halitosis (Bakhrul Fam) and mouth ulcers.<sup>[3,23,24,32]</sup> *N. hindostana* is claimed to be useful in anxiety neurosis and nervous excitability, palpitation (Khafqan) and headache, also in hyperthyroidism and nervous sleeping disorder in the form of powder (Safoof), decoction (Joshada) and extract.<sup>[22,25,26]</sup> German Commission E recommended its uses in functional gastrointestinal complaints and externally for herpes labialis. The hot water extract exhibits antiviral properties, mainly due to rosmarinic acid and other polyphenoids.<sup>[22]</sup>



**Fig. 04: Pharmacological activities of melissa officinalis.**

Aqueous extract inhibits tumor cell dividing.<sup>[22]</sup> Dried leaves or whole herb when used with honey show its efficacy in hypochondriasis, migraine (shaqeeqa), hypertension, bronchial conditions, Graves' disease, attention deficit disorder, and Psychiatric conditions including depression and hysteria and parasitic disease.<sup>[9,10,13,27]</sup> A syrup made with leaves of *N. hindostana* or leaves, seeds and other herbs and drinking it with honey and or water is efficacious in hypocholesteremia, various cardiovascular complaints such as angina pectoris, cardiac thrombosis, tachycardia and weakness of the ear.<sup>[4]</sup> Smelling of this plant also gives same effect.<sup>[4,25]</sup> According to British Herbal Pharmacopoeia, the plant is topically used for antiviral properties.<sup>[22]</sup>

#### VIII. Chemical constituents of badranjboya

Essential oil (0.05%) is found in the plant which contains Geranial (Citral A), Neral (Citral B), 6-methyl-5hepten-2-one-Citronillal, Geranyl acetate, Beta caryophyllene oxide. The ratio of Geranial and Neral is 4:3.

#### A. Aerial part contains

Flavonoids (Cynaroside, cosmosiin, rhamnocitrin, Isoquercitrin), Glucosides, Caffeic acid derivatives, Triterpene acids, Polyphenols, Tannins.<sup>[28]</sup> Two new Triterpenes were isolated from *Nepeta hindostana*, they were named Nepeticin and Nepetidin.<sup>[1]</sup> Nepehinal a new triterpenoidal aldehyde was also isolated from the plant.<sup>[9]</sup> The main ingredient is citronellal (about 30-40%). The drug contains about 4% Rosmarinic acid (also known as labiate tannin).<sup>[15]</sup>

Tyler state that an active principle of the herb, Cis-Transnepetalactone produces stimulatory responses in cats when it is smelled, not when it is administrated internally but the Indian herb *Badranjboya* or *billilotan* does not attract cats nor their aroma stimulate them.<sup>[28]</sup> This statement is contrary to our observation found during drying process of *Badranjboya* collected at Shankar Nagar village of Balrampur District of Uttar Pradesh, India, because the cat showed euphoric action when smelled the fresh plant and became hyperactive,

started rolling around the plant, flipping over it and sniffing, then licking and chewing with head shaking, cheek rubbing and then over rolling of head and rubbing its body with charming and fascinating style. This attraction of cat towards the *Badranjboya* mainly exhibits due to the presence of a constituent "Nepetolactone" that binds to the olfactory receptors of cats, typically resulting in temporary euphoria.<sup>[29]</sup>

#### IX. Some pharmacological studies cardio-Protective and Antioxidant studies

Ahmad *et al.*, (2004)<sup>[30]</sup> screened out the cardioprotective effect of Hydroalcoholic extract of *N. hindostana* on Wistar albino rats against Isoproterenol induced acute myocardial infraction and found its promising role to prevent acute myocardial infraction. Devi *et al.*, (2017)<sup>[31]</sup> evaluated the lipid lowering effect of *N. hindostana* on rats with both aqueous and methanolic extract against intraperitoneal injection of triton WR 1339 (400 mg/kg) for acute study and feeding high cholesterol diet for sub-acute study. They found that lipid levels were significantly attenuated by different doses of aqueous and methanolic extract, but the methanolic extract (400 mg/kg) has lowest atherogenic index and maximum protection in triton and cholesterol diet induced dyslipidemia. This study claims that this lipid lowering effect may be due to the presence of antioxidant constituents in the plant. A clinical study was done by Azhar *et al.*, (2017)<sup>[32]</sup> on 30 patients having risk of atherosclerosis. The patients were treated with 6 gram powder twice a day for two months. The response was evaluated by the assessment of subjective parameters (palpitation, breathlessness, headache and chest pain) and objective parameters (blood pressure, lipid profile, hematocrit value and random blood sugar). The result showed significant reduction in both subjective as well as objective parameters. Kainsa *et al.*, (2015)<sup>[33]</sup> evaluated the antihyperglycemic and antioxidant properties of aqueous and methanolic extracts of the whole herb of *Nepeta hindostana* in alloxan and OGTT induced diabetes in rats. They found that treatment of NHA and NHM extracts (100, 200 and 400 mg/kg) for 7 days significantly attenuated the serum glucose level and

protected against hyperglycemic and alloxan- induced oxidative stress in experimental animal models. This study suggests that its hypolipidemic effect could

represent a protective mechanism against the development of atherosclerosis.



**Fig. 05: Marketed production of *Melissa officinalis* i.e. Melissa oil.**

#### A. Antimicrobial activity of Badranjboya

Amreen *et al.*, (2019)<sup>[34]</sup> studied the antioxidant and antimicrobial activity of essential oils of leaf, stem, flower and aerial part of *Nepeta hindostana* against four Gram- negative and five Gram-positive pathogenic strains. The essential oil from flower showed potent activity (37.5 µg/ml) against *S. aureus* and *S. mutans* but was less active against Gram-negative bacterial strains. In anti-MRSA activity, leaves and flowers exhibited strong activity against *S. aureus* (SA-2071) and *S. aureus* (SA-4627).

#### B. Antiplatelet activity of badranjboya

Vaseem *et al.*, (2016)<sup>[35]</sup> studied antiplatelet activity of ethanolic and aqueous extract of *N. hindostana* at different concentrations using platelet rich plasma (PRP) prepared by centrifugation of rabbit whole blood. *N. hindostana* showed very excellent antiplatelet activity in both aqueous and alcoholic extracts. This study showed that *N. hindostana* could produce promising result for the treatment of blood clot and pulmonary embolism related diseases.

#### B. Anti-inflammatory activity of badranjboya

The plant also shows significant anti-inflammatory activity and reasonable radioprotective action in mice, due to the presence of nepitrin. Agrawal (1982)<sup>[36]</sup> investigated the anti-inflammatory efficacy of nepitrin (5,3',4'-trihydroxy-6- methoxy flavone), a flavonoid, isolated from *N. hindostana* in both acute and chronic models of inflammation in rats. Nepitrin was found to possess significant anti-inflammatory activity in the exudative and proliferative phases of inflammation. This action of nepitrin could be due to its anti-bradykinin and anti-angiotensin action. Nepitrin also possessed anti-pyretic and weak analgesic activity. The essential oil extracted from the plant also showed antifungal and anti plasmodial activity.

#### C. Anti-Alzheimer activity of Badranjboya

Akhondzadeh *et al.*, (2003)<sup>[37]</sup> evaluated potential effect of *N. hindostana* extract in 42 patients of both sexes with mild to moderate Alzheimer's disease aged between 65

and 80 years, with a score of  $>$  or  $=$  12 on the cognitive subscale of Alzheimer's disease assessment scale (ADAS-cog) and  $<$  or  $=$  2 on the clinical dementia rating (CDR). In this study the main efficacy measures were the change in the ADAS- cog and CDR-SB scores compared with baseline. After four month with the treatment of extract of Badranjboya it produces a significantly better outcome on cognitive function than placebo.

#### X. Badranjboya as Lemon balm

Traditionally, people use lemon balm tea to help improve mood, slow cognitive decline, and decrease anxiety levels. It may also help with insomnia, relieve menstrual pain, and support gastrointestinal health. Lemon balm is a lemon-scented herb from the mint family. This plant is native to parts of Europe, Central Asia, and Iran. People often use the leaves of this plant to flavor foods. It may also help individuals with certain conditions. In traditional medicine, people use lemon balm for a variety of purposes, ranging from digestive health to healing wounds. There is limited research on how lemon balm tea specifically may help individuals. This article focuses on lemon balm alongside the uses and benefits of this plant. It also considers the risk factors and side effects of lemon balm.

#### A. Types of lemon balm

Lemon balm, or *Melissa officinalis* L., is a herbaceous perennial with oval, aromatic leaves. In the summer, small white flowers bloom. It is straight forward to grow from a seed in spring. There are many different varieties of lemon balm plants, including:

- Aurea
- Citronella
- Lemonella
- Lime
- Quedlinburger
- Variegated

#### B. Uses and Benefits

People can purchase lemon balm tea in most grocery stores, drug stores. People can also make it at home if they have access to a lemon balm plant. To make lemon

balm tea from the plant, a person should use the following instructions:



**Fig. 06: Lemon balm tea of *melissa officinalis*.**

- Remove fresh leaves and rinse well.
- Lay the leaves on a baking sheet until they dry people can store dried lemon balm for several months and still maintain their flavor.
- Boil water and add dried leaves.
- Allow them to steep, or soak, for about 5 minutes, and then add sugar or honey if desired.

Numerous studies discuss the benefits of lemon balm extract, oils, or capsules. The benefits of lemon balm tea made from lemon balm extract. The researchers concluded that the hot water extract of lemon balm leaf may provide health benefits to glycation-associated tissue damage in blood vessels and skin of healthy adults. Glycation-associated damage links closely to the onset of various diseases and aging phenomena. There may be some therapeutic uses for lemon balm, but the efficacy may change when a person consumes this as a tea made with dried lemon balm. Additional studies are needed to better understand the potential benefits of lemon balm tea. Lemon balm may offer some health benefits, which we outline below.

#### **C. Improve Mood and Cognitive function**

Scholar suggests that lemon balm may benefit mood and cognitive performance. The study demonstrated that treatment with lemon balm led to improvements in tasks involving memory, concentration, and mathematics. The findings suggest that lemon balm may be effective in improving anxiety and symptoms of depression in some people. However, the researchers note that further high quality studies are needed to firmly establish the clinical efficacy of the lemon balm. These findings also relate to lemon balm supplements not lemon balm tea. Another study also demonstrated that chronic administration of lemon balm relieved stress-related effects. Further studies should incorporate a placebo and investigate physiological stress markers.

#### **D. Help with insomnia**

Ingesting lemon balm may help individuals who experience insomnia or have difficulty falling asleep and

staying asleep. lemon balm and the benefits to postmenopausal people. The researchers concluded that they would recommend lemon balm to improve the quality of life of menopausal people with sleep disturbance. An additional study also explored the effects of lemon balm on sleep disturbances in people with chronic stable angina (CSA). The results demonstrated that 8-week supplementation with lemon balm can decrease depression, anxiety, stress, and sleep disorder in people who have CSA. Other studies have found lemon balm to have positive effects on insomnia when combined with other herbs and nutrients. For example,

IQP-AO-101 contains asparagus extract, saffron extract, lemon balm extract, vitamin C, vitamin E, and zinc. The clinical study results show that IQP-AO-101 improves sleep quality and well-being in people with moderate sleep disturbances and is well-tolerated.

#### **E. Support gastrointestinal health**

Individuals who experience frequent gastrointestinal discomfort may benefit from consuming lemon balm. In study on rats demonstrated that lemon balm decreased the intestinal transit time the time it takes food to travel from the mouth through the gastrointestinal tract (GI). Further research is needed to conclude how effective lemon balm is for the GI.

#### **F. Help relieve menstrual pain**

Menstrual cramps, known as dysmenorrhea, can be extremely painful for some people. The consuming lemon balm extract may help reduce moderate to severe dysmenorrhea. The researchers noted that this effect may be related to the antispasmodic effects of this herb inhibit smooth muscle contractions in the GI tract.

#### **CONCLUSION AND RECOMMENDATION**

Badranjboya is an important medicinal plant obtained from the *Nepeta hindostana* of family Lamiaceae, which is effective for various cardiac and psychological ailments as well as inflammatory diseases as claimed in Unani Medicine. From the above review work it is

clearly concluded that this plant could be successfully used in Myocardial Infarction, Angina and Alzheimer diseases. On the basis of the survey of the drug it is recommended that the authentic Badranjboya is *N. hindostana*, so, *N. hindostana* must be considered as the genuine and authentic Badranjboya rather than *Melissa officinalis* as mentioned in some texts.

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