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Review Article

Herbal Antidepressants : A Comprehensive Review of Plant–Based Therapeutic Agents

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ABSTRACT

Depression is a prevalent psychiatric disorder affecting approximately 17% of the global population. Conventional antidepressant therapies often present limitations, including side effects and delayed onset of action, prompting the exploration of alternative treatments. Plant-based drugs have garnered attention due to their diverse phytochemical constituents and multifaceted mechanisms of action. This review synthesizes current research on medicinal plants exhibiting antidepressant properties, highlighting their phytochemical constituents and underlying mechanisms. Key phytochemicals such as flavonoids, alkaloids, saponins, and terpenes have demonstrated antidepressant effects through various pathways, including inhibition of monoamine oxidase, modulation of the hypothalamic-pituitary-adrenal axis, and enhancement of neurotrophic factors While these findings are promising, most studies are preclinical, and further research, including well-designed clinical trials, is necessary to establish efficacy, safety, and standardized dosing. Integrating phytotherapy with conventional treatments may offer a holistic approach to managing depression, but careful consideration of potential interactions and individual patient factors is essential.

INTRODUCTION

DEPRESSION

A psychiatric condition and a mental illness that profoundly disturbs your thoughts, moods, and behavior, increasing your risk of disability, pain, death, or loss of freedom, as determined by a mental health specialist. Depression is a widespread and significant medical disorder that impairs people's feelings, thoughts, and behaviors. Fortunately, it can be treated. Depression can result in despair or a loss of interest in previously appreciated activities. It can cause a variety of mental and physical problems, as well as a decrease in a person's ability to function at work or at home. It is a state of low mood that influences a

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person's mood, feelings, behavior, and thoughts. A common mental disease characterized by sad mood and loss of interest.^[1]



Figure:1 Depression

A chronic illness is mental depression, which impairs a person's mood, thinking, physical health, and behaviour. Depression symptoms have both biological and emotional components. Retardation of thought, action, and hunger are physiologic signs, while emotional markers are mystery, self-esteem apathy, and pessimism, low manifested as feelings of guilt, inadequacy, and ugliness, indecisiveness, and loss of drive. According to the World Health Report, over 450 million people worldwide suffer from mental or behavioural syndromes. This equates to 12.3% of the global disease burden, with a projected increase to 15% by 2020. Patients with significant depression exhibit symptoms that reflect alterations in the brain's monoamine notably norepinephrine, neurotransmitters,

serotonin, and dopamine. It is projected that by 2020, depression will result.^[1]

Anxiety and depression are the most frequent stress-related mood disorders, resulting in disability and early death. Despite its flaws, the monoamine theory of anxiety and depression-like states is widely accepted. In addition to depression, the majority of antidepressants have been shown to be beneficial against anxiety disorders. Neuroscience advances reveal that the pathophysiology of anxiety and depression is influenced by malfunction of the GABAergic system as well as monoamine deficits. GABA antagonists receptor have antidepressant properties and have been demonstrated to enhance 5-hydroxytryptamine dopamine and neurotransmission. Synthetic medications used to treat anxiety and depression have a variety of side ataxia effects, including drowsiness, with benzodiazepines and insomnia, libido with selective serotonin reuptake inhibitors. Naturalderived drugs are thought to have fewer negative effects.Drugs derived from natural sources are thought to have fewer adverse effects while performing similarly to synthetic counterparts in terms of disease treatment. Recently, the quest for innovative pharmacotherapy from medicinal plants for psychiatric illnesses has advanced dramatically, revealing the pharmacological efficiency of several plant species in a number of animal models.^[2]

TYPES OF DEPRESSION

Depression are mainly seven types-







• PERSISTENT DEPRESSIVE DISORDER-

A chronic kind of depression that lasts at least two years. The symptoms are similar to major depression; however, they are less severe and may vary in intensity.

• MAJOR DEPRESSIVE DISORDER-

Characterized by a chronic feeling of sadness or loss of interest in previously loved activities, as well as symptoms such as weariness, appetite changes, and suicidal ideation. It usually lasts at least two weeks.

• POSTPARTUM DEPRESSION-

After childbirth, mothers experience feelings of severe melancholy, tiredness, changes in sleeping or eating routines, and trouble bonding with their babies.

• **BIPOLAR DISORDER-**

Symptoms include mood swings that can range from melancholy to manic or hypomanic. (High or irritated moods, excessive activity, etc.)

• ATYPICAL DEPRESSION-

A form of serious depression in which people experience brief mood improvements in response

to happy experiences. Common symptoms include increased sleep and hunger, heaviness in the limbs, and sensitivity to rejection.

• SEASONAL AFFECTIVE DISORDER-

A sort of depression that happens during specific periods of the year, typically in the winter when there is less sunlight. It is believed to be linked to changes in solar exposure.

• PREMENSTRUAL DYSPHORIC DISORDER-

A severe form of premenstrual syndrome that can result in mood swings, irritability, exhaustion, and depression-like symptoms before to menstruation.

ETIOLOGY

- Possible causes include genetics,
- environmental variables,
- ➢ biochemistry,
- dopaminergic activity,
- endocrine factors
- drug or alcohol abuse
- hormonal changes
- physical sickness.

PATHOPHYSIOLOGY

a. Neurotransmitter Imbalance-

Deficiencies in serotonin, norepinephrine, & dopamine contribute to mood dysregulation.

b. HPA Axis Dysregulation-

Chronic stress causes excessive cortisol production, impairing brain function, particularly in the hippocampus and prefrontal cortex.

c. Brain Structure Changes-



Depression is associated with shrinkage of the hippocampus and altered activity in the amygdala and prefrontal cortex.

d. Inflammation-

Elevated levels of proinflammatory cytokines can disrupt neurotransmitter function and contribute to depressive symptoms.

e. Genetic Factors-

Family history and specific genetic variants may increase susceptibility to depression.

f. Endocrine Disruptions-

Imbalances in thyroid function and sex hormones can also contribute to depressive symptoms.

g. Cognitive & Psychological Factors-

Negative thought patterns, trauma, and stress can trigger or exacerbate depression.



Figure: 3 Pathogenesis of Depression

CLINICAL MANIFESTATION

- ➢ Helplessness
- > Thoughts of death
- ➢ Guilt
- > Anger
- ➢ Energy loss
- Withdrawing from family & friends
- ➢ Sleep problem
- Alcohol & drug abuse
- ➢ Concentration
- ➢ Fatigue
- Recalling details & making decisions
- Worthlessness

- Insomnia
- Restlessness
- Aches, Pains & headaches
- Digestive problems
- Appetite loss
- Suicide attempts
- ➤ Sad
- Anxious

DIAGNOSIS

- Overview
- Diagnosis guide
- Beck depression inventory



- > HDRS
- Patient health questionnaire-9
- > MADRS
- Geriatric depression scale
- Zung self-rating depression scale
- ≻ CES-D

NON-PHARMACOLOGICAL TREATMENT

a) ACUPUNCTURE –

Acupuncture is a traditional Chinese medicine treatment that involves inserting small needles into the skin at certain locations on the body to balance the flow of qi and relieve symptoms of a variety of diseases such as pain, sleeplessness, and depression. Acupuncturists suggest employing the procedure in conjunction with psychotherapy.

b) ELECTROCONVULSIVE THERAPY -

Electroconvulsive therapy (ECT) is a specific type of electroconvulsive therapy. It is a minimally invasive method in which patients are administered a shock (formerly known as "shock therapy") to induce a seizure while anesthetized.

c) COPING AND SELF HELP-

People can take a range of steps to assist alleviate the symptoms of depression. Many people find that regular exercise improves their mood. Getting enough decent sleep on a regular basis, eating a nutritious diet, and avoiding alcohol (which is a depressant) will help to ease depression symptoms.

d) TALK THERAPY-

Talk therapy, sometimes known as "psychotherapy," is sometimes used alone to treat mild depression, although it is most commonly used in combination with antidepressant drugs to treat moderate to severe depression.

PHARMACOLOGICAL TREATMENT-

The primary pharmacological treatment for depression is the use of antidepressants. These drugs are intended to repair abnormalities in neurotransmitters that are believed to play a function in mood regulation.

- a) Selective Serotonin Reuptake Inhibitors (SSRIs)-Fluoxetine, Sertraline, Escitalopram, paroxetine, Citalopram
- Mechanism of action- These drugs raise serotonin levels in the brain by preventing reuptake into presynaptic cells, increasing its availability in the synaptic cleft.

Side effects-

- Nausea
- Insomnia
- Sexual dysfunction
- Weight gain
- increased risk of suicidal thoughts
- b) Serotonin Norepinephrine Reuptake Inhibitors (SNRIs)- Venlafaxine, Duloxetine, Desvenlafaxine
- Mechanism of action- SNRIs block the reuptake of serotonin and norepinephrine, increasing their levels and activity in the brain.
- Side effects-
- Elevated blood pressure
- Nausea
- Dizziness
- Sweating



- Weight gain
- Insomnia
- c) Tricyclic Antidepressant (TCAs)-Amitriptyline, Nortriptyline, Imipramine
- Mechanism of action- TCAs inhibit the reuptake of serotonin and norepinephrine, but they also influence other neurotransmitters and receptors, adding to their adverse effects.
- Side effects
- Dry mouth
- Constipation
- Blurred vision
- Urinary retention
- Weight gain
- Dizziness
- Heart arrythmias
- d) Monoamine Oxidase Inhibitors (MAOIs)-Phenelzine, Tranylcypromine, Isocarboxazid
- Mechanism of action- MAOIs inhibits the enzyme monoamine oxidase which breakdown serotonin norepinephrine and dopamine. This leads to increased level of these neurotransmitters.

***** Side effects

- Hypertensive crisis
- Dizziness
- Insomnia
- Sexual dysfunction
- e) Atypical Depressant- Bupropion, Mirtazapine, Trazodone

* Mechanism of action-

- <u>Bupropion</u> inhibits the reuptake of dopamine and norepinephrine.
- <u>Mirtazapine</u> boosts the release of serotonin and norepinephrine.
- <u>Trazodone</u> primarily affects serotonin; however, it is commonly used for its sedative effects.
- **Side effects**
- Sedation
- Dry mouth
- Insomnia
- Weight gain



Figure:4 Classification of Antidepressant Drugs



PLANTS HAVING ANTIDEPRESSANT ACTIVITY

Traditional medicine is natural medicine or treatment based on traditional uses of natural substances such as plants, animals, or their products, and others (including some inorganic chemicals). It has been described in religious texts, personal cultural traditions, and physical manipulations, including torture.^[13] Plant-based medications are gaining popularity and are being studied for a variety of ailments, including CNS disorders such as depression. ^[8] Folklore conventions, cultural habits, social practices, and religious beliefs all have a significant impact on the type, preparation, and application of traditional medicines.^[8]

SR NO	Plant name	Family	Parts used	
1	Fooniaulum vulgano	Aniaaaaa	Emite	
1.	Spimuling platongig	Cuenonhuesee	Fiults	
2.	Dhullanthua amamua	Dhyllonthaasaa		
<u> </u>	Phylianinus amarus	Phynanunaceae	Leaves	
4.	Passifiora Joellaa	Passifioraceae	Leaves	
5.	Nymphaea alba	Nymphaeaceae	Flowers	
6. 7	Holoptelea integrifolia	Ulmaceae	Leaves	
7.	Dacus carota	Apiaceae	Roots	
8.	Jasninumsambac	Oleaceae	Leaves	
9.	Amarantha spinosus	Amaranthaceae	Whole plant	
10.	Eicchornia crassipes linn	Pontederiaceae	Plant leaves and shoots	
11.	Asparogusrecemosu	Asparagaceae	seeds	
12.	Eclipta alba	Asteraceae	Leaves	
13.	Cucurbita pepo	Cucurbitaceae	Seeds	
14.	Nardostachysjatamansi	Valerianaceae	Roots	
15.	Uncarialanosa	Rubiaceae	Stem and hooks of	
	wallichvarappendiculataridsd		plants	
16.	Pogostemoncablin	Lamiaceae	Leaves	
17.	Feijoa sellowlana	Myrtaceae	Fruits	
18.	Eugena caryophyllus	<i>Eugena caryophyllus</i> Myrtaceae Flower bud		
19.	Cressa cretica	Convolvulaceae	Whole plant	
20.	Hedrantherabarteri	Apocynaceae	Roots	
21.	Morus mesozygia	Moraceae	Stem bark	
22.	Glycyrrhiza uralensis	Leguminaceae	Roots	
23.	Lafoensiapacari	Lythraceae	Leaves	
24.	Schinus molle L	Anacardiaceae	Leaves	
25.	Tabebula Avellaneda	Bignoniaceae	Bark	
26.	Piper laetispicum	Piperaceae	Stem and roots	
27.	Allium macrostemon	Amarvllidaceae	Bulb	
28.	Hvpericum reflexum L	Hypericaceae	Aerial parts	
29.	Mitragyna speciosa	Rubiaceae	Leaves	
30.	Rosmarinus officinalis	Labiatae	Leaves	
31.	Salvia elegans	Lemiaceae	Leaves	
32.	Berberis aristata	Berberidaceae	Roots	
33.	Mangolia bark and	Magnolieaceae.	Bark and rhizome	
	ginger rhizome	zingiberaceae		
34.	Valeriana officinalis Caprifoliaceae Roots		Roots	
35.	Marseliaminuta	Marsileaceae	e Roots	
36.	Tagetes lucida	Asteraceae	Aerial part	
37.	Bacoba monnieri	Scrophulariaceae	Aerial parts	

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38.	Emblica officinalis	Euphorbiaceae	Fruit
39.	Clitoria ternate	Fabaceae	Root, bark
40.	Crocus sativus	Iridaceae	Petals
41.	Gingko biloba	Ginkgoaceae	Leaves
42.	Areca catechu	Arecaceae	Areca nut
43.	Apocynumvenetum linn	Apocynaceae	Leaves
44.	Aloysia polystachya	Verbenceae	Aerial parts
45.	Allium cepa	Liliaceae	Bulb powder
46.	Boophonedistica	Amaryllidaceae	Whole plant
47.	Curcuma longa	Zingiberaceae	Root
48.	Cimicifuga racemosa	Ranunculaceae	Root
49.	Zingiber officinalle	Zingiberaceae	Rhizome
50.	Siphocamphylusverticillatus	Campanulaceae	Aerial part
51.	Rhazya stricta	Apocynaceae	Leaves
52.	Paeonia lactiflora pall	Paeoniaceae	Root
53.	Mimosa pudica linn	Mimosaceae	Leaves
54.	Morinda officinalis F.C.	Rubiaceae	Root
55.	Glycyrrhiza glabra	Leguminaceae	Root
56.	Canavalia brasiliensis	Fabaceae	Seed
57.	Albizzajulibrissin	Fabaceae	Bark
58.	Albizzia lebbeck	Mimosaceae	Bark
59.	Bupleurum falcatum	Apiaceae	Fruit
60.	Gastrodiaelata	Orchidaceae	Rhizome

VITEX NEGUNDO LINN

Vitex negundo Linn. (Verbenaceae) is also known as the five-leafed chaste tree.^[4] It is a woody, aromatic shrub that grows into a small tree. ^[3] It is a shrub or a small slender tree with thin grey bark, quadrangular branchlets that are pale and covered in fine tomentum. The leaves are 3-5 foliate, the leaflets are lanceolate and acute, the terminal leaflet with a petiole is 1-1.3 cm long, the lateral leaflets are smaller with a very short petiole, and all are practically globorous, covered with a fine white tomentum beneath, and have a sharp base. Flowers occur in pedunculate branched tomentose cymes that are opposed along the quadrangular tomentose rachis of a broad terminal, usually complex. Pyramidal panicle axillary peduncles in the top axils are occasionally seen. The ovary's stigma has been forked. Drupe is less than 6mm diameter and turns black when ripe.^[4] It thrives in humid environments or beside watercourses in

wastelands and mixed open forests, and has been found in Afghanistan, India, Pakistan, Sri Lanka, Thailand, Malaysia, Eastern Africa, and Madagascar. It is grown commercially as a crop in regions of Asia, Europe, North America, and the Caribbean.^[5] Vitex is the largest genus in the Verbenaceae family, with 250 species scattered worldwide. Vitex species are deciduous shrubs. The species employed in medicine is V.agnuscastusLinn. And V. negundoLinn.V.agnus-castus is found on riverbanks and coastlines throughout the Mediterranean region, Southern Europe, and Central Asia.^[5]

Table 1.3	Scientific	Classification	of	plant.
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Kingdom	Plantae
Subkingdom	Tracheobionta
Super division	Angiosperms
Division	Tracheophyta
Class	Eudicots
Subclass	Rosids
Order	Lamiales
Family	Verbenaceae/ Lamiaceae



Genus	Vitex	
Species	Vitex negundo	

Synonyms: Vitex trifolia Linn, Vitex purpurea Lour, Vitex rotundifolia L, Vitex vulgaris juss, Vitex integrifolia Roxb, Chaste tree.

Commonly Known As: Nirgundi, Shambhalu, Lagundi, Five-leaved chaste tree, Chinese chaste tree, Indian privet, Nishinda, Chaste tree, Honje, Panchanguli

Parts for used: Leaves, Roots, Seeds, Flowers and Bark



Figure:5 Leaves of Vitex negundo Linn.



Figure:6Flowers of Vitex negundo Linn.



Figure:7 Roots of Vitex negundo Linn



Figure:8Seeds of vitex negundo Linn.



Figure: 9 Stems of Vitex negundo Linn.



Figure: 10Bark of Vitex negundo Linn.



Morphology

Vitex negundo linn, also called Nirgundi or the five-leaved chaste tree, is a tiny tree or shrub that is a member of the Verbenaceae family.

Root

The plant is anchored to the ground by its welldeveloped, fibrous root system, which also aids in the absorption of water and nutrients.

Stem

The stem has a quadrangular shape, is woody, can reach a height of three meters, and has many side branches. The bark is hard and greyish-brown, with younger branches that are greenish or reddish.

Leaves

With three to five leaflets, the leaves are palmate, opposite, and compound. The leaflets are lanceolate or ovate in form, with a crenate or serrated edge and a pointy apex. The leaflets have small hairs on the underside and are paler than the upper surface, which is dark green. When crushed, the leaves release a powerful, aromatic perfume, and the petiole is lengthy.

Flowers

The plant's inflorescence is terminal or axillary panicles. The tiny blooms are either lavender, purple, or blue. Each flower has a two-lipped corolla and is bilateral. The aroma of the blossom is powerful and pleasant. They show up in the summer and when it rains. Because of their heterostylous nature, the blooms can be divided into two categories according to the length of their styles.

Fruits

The fruit is a drupe that is dry. When ripe, it changes from green to blackish purple and has a globular or avoid shape. The fruit has a solitary seed and measures roughly 4-5 mm in diameter.

Seeds

The seeds are typically 1-2 mm in size, smooth, round, and dark in colour. Animals or the wind spread the seeds.

Heights and Growth Habit

Usually reaching a height of two to three meters, *Vitex negundo* grows as a small tree or shrub. Its growth is erect or spreading, with many branches.

Aromatic properties

As is the case with many plants in the Verbenaceae family, the plant is scented, especially its leaves and blossoms.

Phytoconstituents

Plant contains Alkaloids, Flavonoids, Triterpenoids, Phenolic compounds, Essential oils, Terpenes, Flavonoid Glycosides, Glycosides, Saponins, Tannins, Steroids.

Nutrition details of Vitex negundo linn

*Vitex negundo linn*contains vitamin C, vitamin A, calcium and it contains some minerals as iron, potassium, magnesium.

Pharmacological action of Vitex negundo linn

Anti-inflammatory, antioxidant, antimicrobial, analgesic, antipyretic, antispasmodic, hormonal regulation, hepatoprotective, neuroprotective, anticancer properties, antibacterial, antifungal, antidiabetic effect, immunomodulatory effects, wound healing, antihypertensive effects, antianxiety, sedative effects, gastroprotective effects,



anthelmintic, respiratory health benefits, antiviral properties, detoxification, anti-aging effects, cardioprotective effects, anticancer, memory enhancement, muscle relaxant, mood stabilizer, liver protection, appetite stimulation, enhancing circulation, preventing hair loss, detoxifying the skin, insect repellent, cough suppressant, antigout, enhancing lactation.

Traditional uses of the plant

Traditional medicine mainly comprises of Indian Ayurveda, Arabic Unani medicine and traditional Chinese medicine. In Asia and Latin America, populations continue to use traditional medicine as a result of historical circumstances and cultural beliefs. Traditional medicine accounts for around 40% of all health care delivered in China. Up to 80% of the population in Africa uses traditional medicine to help meet their health care needs.^[4]

Ayurveda

The plant is mentioned in verses of the Charaka Samhita, which is unquestionably the most ancient and authoritative handbook on Indian Ayurveda. In Sharma's exposition on the Charaka Samhita, Vitex negundo is classified as an anthelmintic and prescribed as a vermifuge.Tirtha describes further Ayurvedic uses for Vitex negundo.17 People sleep on pillows loaded with Vitex negundo leaves to treat catarrh and headaches, and they smoke the leaves for relief. Crushed leaf poultices are used to treat headaches, neck gland sores, tubercular neck swellings, and sinusitis. The essential oil from the leaves is very beneficial in treating venereal illnesses and other syphilitic skin conditions. A leaf decoction containing Piper nigrum is used to treat catarrhal fever with heaviness of the head and poor hearing. A tincture of the root bark relieves bladder irritation and rheumatism. Jadhav and Bhutani18 describe the Ayurvedic usage of Vitex negundo in dysmenorrhea. Patkar19 refers to the formulations detailed in Anubhoga Vaidya Bhaga, a compendium of cosmetology formulas, which outline the usage of Vitex negundo leaves in the well-known rejuvenation procedure Kaya Kalpa.

Chinese medicine

The Chinese Pharmacopoeia prescribes the fruit of Vitex negundo in the treatment of inflamed, irritated, and swollen eyes, headache, and arthritis. ^[4]

Folk Medicine

Despite the arrival of modern medicine, folklore medical systems continue to serve a considerable portion of the population, particularly in rural and tribal areas. 21 The entries on Vitex negundo's various applications in folk medicine have been grouped regionally to emphasize the plant's ethnobotanical richness and ubiquity, and the details are shown in Table 1.

SR. NO	COUNTRY	LOCAL NAME	USED IN THE TREATMENT OF
1	Bangladesh	Chittagong	Weakness, Headache, Vomiting, Malaria, Black fever
2	China	Buging'iab	Common cold, Flu and Cough
3	Nepal	Simali, Marvandaey	Sinusitis, Whooping cough
4	Pakistan	Nirgud, Kalgari	Used as anti-allergenic agent and
			Used as medicine for buffaloes in colic

Table: 1 Uses of *Vitex negundo* in folk medicine outside India

V.negundo leaves are considered tonic and vermifuge, and are taken combined with long pepper in catarrhal fever.^[5]

V.rotundifolia fruits have been used in folk medicine to treat headaches, colds, migraines, eye pain, female hormone abnormalities, asthma,



chronic bronchitis, and gastrointestinal illnesses such as bacterial dysentery and diarrhoea.^[5]

In Asian countries, *V.trifolia* has been used as an anti-inflammatory and sedative for headache, rheumatism, and the common cold, as well as an anti-trypanosomal agent. The plant is a traditional Chinese medicinal used to treat cancer.^[1]

CHENOPODIUM ALBUM LINN

Bathua is the local name for *Chenopodium album*, an herbaceous vegetable plant belonging to the Chenopodiaceae family. In Bombay Presidency and other parts of India (Kashmir and Sikkim), it is grown as a pot herb, generally in gardens, but occasionally in the corners of early grain fields. ^[8]



Figure: 11 Leaves of Chenopodium album.

Die 1.2 Scientific Classification of pi		
Kingdom	Plantae,	
Subkingdom	Tracheobionta,	
Superdivision	Spermatophyta,	
Division	Magnoliophyta,	
Class	Magnoliopsida,	
Subclass	Caryophyllidae,	
Order	Caryophyllales,	
Family	Chenopodiaceae,	
Genus	Chenopodium,	
Species	album L.	

Table 1.2 Scientific Classification of plant.

1. Synonyms:C.album,C.lanceolatum,C.missouriense,C.polymorphum,Chenopodiumstevensii,Chenopodium

amaranticolor, Chenopodium giganteum, Chenopodium suecicum.

- 2. **Commonly known as:**Bathua, lamb's quarters, wild spinach, fat hen, bathu, pigweed.
- 3. Parts for Use: Leaves, seeds and roots.



Figure 12: Seeds of *Chenopodium album* and Root of *Chenopodium album*

- 1. **Morphology:** *C. album,* also referred to as Goosefoot or Bathua. It is an upright, green/reddish plant that ranges in height from 0.3 to 3.5 m. Additionally, it is an odourless plant.
- 2. **Stems:**Rarely are stems slim, angled, and striped in red or purple and green.
- 3. Leaves: The size and shape of plant leaves vary greatly. Leaves can occasionally be 15 cm long, toothed, lanceolate, sharp, or irregularly lobulated.
- 4. Flowers: Flowers feature mealy spikes that become thyrsoid in cultivated species, and



they resemble cluster-forming complexes or paniculate flowers.

5. **Seeds:**Typically, seeds are 1.5 mm in diameter, orbicular, compressed with a sharp edge, and feature a smooth, glossy, fully annular embryo.^[3]

It is 0.3-3 m tall, upright or climbing, mealy or green and reddish, odorless, and frequently has stripes on its stem. Cultivated plants can have leaves that are 15 cm long, oblong, ehombic, deltoid or lanceolate, obtuse or acute, whole, toothed or irregularly lobulate, and have long, thin petioles. The embryo is fully annular. The plant increases hunger. The herb contains aphrodisiac, diuretic, laxative, and anthelmintic properties. Additionally, it is utilized to treat piles, eye conditions, throat issues, abdominal discomfort, and diseases of the heart, blood, and seeds. The leaves contain a lot of albuminoids, other nitrogencontaining chemicItals, and important oil mineral substances, especially potash salts. Hindu doctors advise using the plant to treat splenic enlargement and hepatic diseases.

According to ethnobotanical research conducted i n Chikar and its neighboring regions, Chenopodiu m seeds and leaves are used in traditional medicin e to treat hepatic disorders and enlarged spleens.

An aqueous preparation of the leaves is also taken orally to treat jaundice.^[8]

In India, the wild edible plant known as bathua (Chenopodium album) is grown as a green vegeta ble.In various states, it is typically eaten raw in sa lads or cooked according to traditional recipes.Pr oteins, fiber, iron, calcium, vitamins A and C, car otenoids, and vital amino acids like lysine, leucin e, and isoleucine are all abundant in C. album lea ves.Because of its increased content of several ess ential minerals, including sodium, zinc, nitrogen, phosphorus, potassium, calcium, magnesium, iron , and manganese, Bathua is regarded as a mineral. It functions as a strong antioxidant that may scave

nge free radicals such hydroxyl, superoxide, hydr ogen peroxide, and nitric oxide because of its flav onoid (caempferol, quercetin, and isoramnetin) an d carotenoid concentrations. Anorexia, cough, dys entery, diarrhea, piles, inflammation, and pain reli ef are all conditions that can be treated with C. al bum.Once more, research has shown that it is an antibreast cancer bioagent that increases cell toxic ity in human breast cancer cell lines and stops the growth of cells from progressing.^[10]Additionally, bathua has potent antibacterial and antifungal pro perties against Pseudomonas aeruginosa and Stap hylococcus aureus.Consuming vegetables high in fiber but poor in nutrients or phytochemicals, like ordinary cabbage, does not produce the same im mune response as consuming vegetables rich in n utrients and phytochemicals, like C. album.When combined to grains and legumes, C.album's diverse amino acid levels would create a nutrientdense diet that is appropriate for people of all ages. Therefore, it is recommended that GVs like bathua be included in meals in order to improve our nutritional status and fortify our immune systems. Because it tastes nice and is full of bioactive phenolics with strong antioxidant qualities, this plant is best used as a food or medicinal ingredient throughout the winter, particularly in February.^[9]

Crocus Sativus (Saffron)

Originating in green, saffron, botanically known as Crocus sativus L., belongs to the Iridaceae family and was brought to Turkey, Iran, Pakistan, the west Himalayas, Italy, Spain, and Morocco. Its fragrant, golden stigmas are dried and used as a dye and to flavour and color food. Crocin, one of its primary colouring pigments, dissolves readily in water. The primary component responsible for saffron's distinct "bitter" flavour is the glycoside picrocrocin.^[13]



Figure 10 :Flower of Crocus sativus

Its maximum height is 30 cm. The diameter of its corm is 3 cm. The leaves are 2 to 3 mm diameter and up to 20 cm long, either erect or spread. One or two flowers with an orange stigma, yellow anther, and violet calyx.^[13]

One of the priciest spices, saffron has been utilized in traditional medicine. 63% carbohydrates, 12% protein, 10% water, 5% fat, 5% crude fiber, and 5% minerals make up its composition. Dried stigma is the component utilized in phytotherapy. It has vitamins, carotenoids, and flavonoids. The apocarotenoids crocin, picrocrocin, and safranal are examples of active ingredients with antioxidant activity. They can scavenge radicals and modulate enzymes that fight oxidative stress. They also have a pro-apoptotic effect, reduce telomerase activity, and decrease the synthesis of DNA, RNA, and proteins.^[11]

Saffron gets its unique color, flavor, and scent from these same elements. N-acetylcysteine, crocin, and crocetin have all been shown to have antidepressant properties that can help reduce depressive symptoms. The opioid system and the GABAergic system (via GABAA receptors) may be involved in the mechanisms underlying antidepressant action. In animal studies, elevated levels of brain-derived neurotrophic and nerve growth factors were associated with antidepressant effect.^[11]

Saffron extract or its active ingredients have demonstrated a variety of central nervous system effects, including sedative, memory-enhancing, antidepressant, and anticonvulsant properties.^[11] Saffron can help with major depressive disorder, according to a 2013 meta-analysis, and a 2014 systematic review found that it exhibited antidepressant properties comparable to those of synthetic antidepressants. An update on the usage of saffron for mild to moderate depression in synthetic comparison to placebo and antidepressant therapies was published in 2019 by a recent meta-analysis. The statistical analysis of nine of the eleven randomized controlled clinical that were taken into consideration trials demonstrated that oral administration of saffron preparations in pharmacological doses reduces depression symptoms in comparison to the placebo group and is equivalent to treatment with synthetic antidepressants.^[11]

Safranal, which makes up around 60% of the volatile components of saffron, is the primary fragrance component.^[12]

In clinical trials, 30-200 mg of saffron extract daily was the usual dosage. These studies did not report any notable adverse events in terms of clinically assessed safety. In mice, 4.1 g/kg of saffron administered orally is the acute fatal dose. There have been reports of saffron rates having a teratogenic effect on pregnant saffron field workers. Consequently, using saffron supplements while pregnant is not advised.^[12]

Saffron's toxicological profile raises safety concerns, despite new evidence from recent research supporting its usage in treating depression. However, according to the dosages employed in the clinical trials thus far, saffron may help reduce depression and does not have noticeably more negative effects on non-pregnant people than it would in the absence of treatment.^[12]

Mellisa officinalis (Lemon Balm)

Paper herb *Mellisa officinalis*, a perennial plant in the Lamiaceae family, is a well-liked herb with a



variety of medicinal uses. It is said that a significant amount of active chemicals, such as rosmarinic acid, are what provide lemon balm its overall health benefits. Melissa officinalis possesses antidepressant, antimicrobial, antiinflammatory, and antioxidant properties. In addition to ophthalmology, gynecology, oncology, gastrointestinal, and cardiology, it can be used to treat sleep disorders, neurodegenerative diseases, and obesity. The literature on Melissa officinalis's chemical makeup and potential use in both medicine and functional foods is included in the review. Additionally, a summary of the herb's adverse effects and contraindications was provided.^[14]



Figure 11: Flower of *melissa officinalis L*.

It is found natively throughout west Asia and the Mediterranean. Furthermore, it is widely grown in North America and Europe. Mellisa, also known as lemon balm, balm, or common balm mint, is a herb that is prized for its distinctive lemon flavor and scent. Notes on lemon balm date back to ancient times, when Hippocrates and Dioskurides were among the first to describe it. Avicenna (980–1037) suggested it to fortify the heart throughout the Middle Ages, while Paracelsus (1493–1541) made "the elixirs of life" with lemon balm. Melissa officinalis has long been recognized for its ability to prevent baldness, strengthen the weak, and restore youth. Lemon balm leaves, herbs, and essential oil are utilized in herbal medicine. In addition to its medical use, Melissa officinalis is becoming more and more popular as an ingredient in functional foods and supplements because of its many health-promoting qualities. A compilation of the most recent information on lemon balm's medicinal qualities will make it easier to use it in culinary products as well.^[14]

In Iran, this plant is commonly found in the provinces of Tehran, Golestan, Azarbayjan, Lorestan, and Kermanshah. It is known as "Badranjboyeh." The portions of the plant that are utilized as medicine are the top aerial section and dried or fresh leaves. [17] Lemon balm has long been utilized for a variety of medicinal conditions, including tonic antispasmodic, carminative, diaphoretic, surgical wound dressing, sedativehypnotic, memory-boosting, and headache relief from stress. Currently, it is used as an antiviral to promote the healing of herpes simplex cold sores and as a sedative-hypnotic. Lemon balm has also been used in Iranian traditional medicine to cure sadness, loss of enthusiasm and energy, and irritability and anxiousness in young girls and women. [15]

Melissa officinalis has a lemony scent and flavor and includes volatile oil containing citral. Lemon balm's therapeutic use dates back to "De Media," which was written between 50 and 80 B.C. During the Middle Ages, it was used as a medicinal agent in European nations on the advice of Paracel- sus. It has been presented as a revitalizing component and has been suggested as a successful remedy for disorders of the neurological system. Recent research also suggests that lemon balm has antibacterial, behavioral-modifying, and spasmolytic qualities. Because of its calming properties, lemon balm is said to help with sleep disturbances. It works well to lessen problems of the nerve system.^[16]

Hypericum perforatum (St. John's Wort)



Hypericum perforatum, also known as St. John's wort (SJW), is the most widely used complementary medicine (CM) for depression self-treatment.One It is also frequently used to treat self-described worry and tension. According to a community-based survey conducted in Australia, for instance, about 3% of people sought CAM for anxiety or depression, with SJW being the most common option. Participants frequently sought therapy from multiple CAMs. ^[18]It bears little yellow blooms with five petals and can reach a height of one meter. The plant, which is frequently seen in fields and by the sides of roads, is well-known for its capacity to thrive in a variety of environments, including wetlands and dry pastures. Originally from Europe, this herb is now found in many parts of the world.^[20]

According to a recent Cochrane systematic analysis, SJW was just as effective as prescription antidepressant drugs (AD) and better than a placebo overall for those with mild to moderately severe depressive symptoms. Because SJW has fewer side effects than ADs, it's a viable substitute for pharmaceutical intervention.^[18]



Figure 12: Flower of Hypericum perforatum

For ages, traditional medicine has utilized *Hypericum perforatum* (St. John's wort) to treat depression. The plant, which grows widely along roadsides and in meadows, is known as St. John's wort because it blooms around the feast day of John the Baptist, which is June 24. When crushed, the bright yellow, five-petaled blossom, which

resembles a halo, releases a red liquid that early Christians believed to be the blood of their beloved St. John.^[19]

These days, mild to moderate depression is frequently treated with St. John's wort extract. In terms of energy, it eliminates toxins and heat from the liver while restoring and uplifting the "Vital Spirit." I frequently describe the plant as a mood stabilizer, stress reducer, and neurological adaptogen.^[19]

Numerous bioactive substances, such as hypericin, hyperforin, and flavonoids like quercetin, rutin, and kaempferol, are found in St. John's wort. The primary components thought to be in charge of the antidepressant action are hypericin and hyperforin. A photosensitive substance called hypericin is thought to prevent the brain from reabsorbing some neurotransmitters, including noradrenaline, serotonin, and dopamine. However, it has been demonstrated that hyperforin raises these neurotransmitter levels in the brain, improving mood.^[20]

Another class of naturally occurring bioactive substances included in St. John's wort are flavonoids. It has been demonstrated that flavonoids have several positive health effects, such as anti-inflammatory and antioxidant Flavonoids antioxidant capabilities. have properties because they can scavenge free radicals, which are unstable chemicals that can harm cells and tissues through oxidative damage. The body normally produces free radicals as a byproduct of metabolism, but they can also be created by outside sources like radiation, pollution, and cigarette smoke. Free radicals can harm DNA, proteins, and other cellular constituents when they build up in the body, which can result in a number of health issues like cancer, heart disease, and aging.^[20]

REFERENCES



- Tiwari. N, Mishra. A Bhatt.G&Chaudhary.A "evaluation of antistress potentials of Negundin A from vitex negundo in acute stress induced mice" European Journal of medicine plant (2015) 1-8.
- Kothari.s, Minda. S & S. D. Tonpay "anxiolytic and antidepressant activities of methanol extract of aegle marmelos leaves in mice"Indian J PhysiolPharmacol 2010; 54 (4) : 318–328.
- Sharma K, Akansha, Chauhan E.S "pharmacological and therapeutic potential of vitex negundo (nirgundi): a review" International Journal of Scientific Research and Review 2018;ISSN NO: 2279-543X.
- Aswar M.K, Abhijeet A. Bidkar1, Kishore N. Gujar 2, Tanay G. Athawale "Anxiolytic like effects of leaves extract of Vitex negundo (L) (fam: -verbaceae) in elevated plus maze test"journal of natural remedies (2012) 141-15.
- Elayaraja.A, Shaik A.R, Phani K.K, "Antianxiety activity of hydro alcoholic extract of Scoparia dulcis Linn. assessed using different experimental anxiety models in rodents" International Journal of Pharmacological Research (2015) ISSN: 2277-3312.
- Gulhane .H Misra A.K, Reddy P, Pandey.D,Gulhane.R Verma S.K"effects of piper bettle leaves (paan) extract as antidepressant and anti-anxiety in experimental animals" Mintage journal of Pharmaceutical & Medical Sciences(2015) 12-15.
- 7. Khanum.F and Razack.S "Anxiety- Herbal Treatment: A Review" Research and Reviews in Biomedicine and Biotechnology (2010), 71-89.
- 8. Yadav S.K "Antidepressant like effects of hydro ethanolic extract of Chenopodium Album on cums induced depression in mice", world journal of pharmaceutical research(2021)2125-2137.

- 9. Sharma. A, Kaur.S, Shri.R, "Evaluation of antidepressant activity of Chenopodium Album extracts and fractions in mice", international journal of pharmaceutical sciences and research (2021)2707-2715.
- Singh. S, Gupta.R, "Ethno-pharnacological activities of some important medicinal plants on mental health" Journal of pharmaceutical technology research and management (2024) 1-13.
- Kenda.M, Glavac N.K, Nagy.M and Dolenc M.S, "Medicinal plants used for anxiety,Depression,or Stress treatment" MDPI journal(2022) 1-19.
- 12. Hosseinzadeh.H, Motamedshariaty.V and Hadizadeh.F, "antidepressant effect of kaempferol, a constituent of saffron (crocus sativus) petal, in mice and rats" Pharmacologyonline 2 (2007) 367-370.
- 13. Mahapatra.D, Beniwal.AandDas.M, "Therapeutic Effects of Winter Greens"Just agriculture (2023) 300-305.
- 14. Emamghoreishi M., Talebianpour M.S., "Antidepressant effect of Melissa officinalis in the forced swimming test" Daru journal of pharmaceutical science(2009) 42-47.
- 15. Khodaei M.K, NoorbalaA.A, Yarani.R, Emadi.F,Emaratkar.E, Faghihzadeh.S,Parsian.Z, Alijaniha.F, Kamalinejad.M and Naseri.M, "A double-blind, randomized pilot study for comparison of Melissa officinalis L. and Lavandula angustifolia Mill. with Fluoxetine for the treatment of depression" BMC journal (2020) 2-9.
- 16. Namjou.A, Yazdani.N, abbasi.E and Kopaei M.R, "TheAntidepressantActivity of Matricaria chamomilla andMelissa officinalis Ethanolic Extracts in Non-Reserpinized and Reserpinized Balb/C Mice"Jundishapur journal of microbiology(2018) 1-6.

- Świąder.K, Startek.K, Wijaya C.H, "The therapeutic properties of Lemon balm (Melissa officinalis L.): Reviewing novel findings and medical indications" Journal of Applied Botany and Food Quality (2019) 327-335.
- 18. Pirotta.M, Willis.K, Carter.M, Forsdike.K, Newton.D, Gunn.J, "Less like a drug than a drug': The use of St John's wort among people who self-identify as having depression and/or anxiety symptoms "Complementary therapies in medicine (2014) 870-876.
- 19. Yance.D, "Antidepressants May Be No More Effective Than Placebo: But What About St.

John's Wort and Other Herbal Medicines" Lancet journal (2019).

20. Rychlewski. P, Kamgar.E, SzkudlarzS.M, Kowalczewski P.Land Zembrz.J,
"Determination of the contents of bioactive compounds in St. John's wort (Hypericum perforatum): Comparison of commercial and wild samples"deg journal (2023).

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