An Overview of Indian Traditional Medicinal Plants with Anti-Psychological Potentials

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Abstract
The traditional Indian system of medicine (Ayurveda) describes different modalities involved in the prevention and treatment of disease and stresses upon the role of diet, lifestyle and drugs as cornerstones of therapy. Medicinal plant products are known to modify different aspects of human physiology and exert an alleviating influence on several path-physiological states, and concepts of psychological disorder. It now appears that some of the beneficial effects of Indian medicinal plants, proposed in Ayurveda by Charaka and Sushruta Samhita, may be due to these “antipsychological” effects. Several research groups have worked on the scientific basis of such “antipsychological” effects of plant products, and as a result, considerable data has accrued. The present review summarizes some of these experimental data in an attempt to justify some of their beneficial effects in health and disease, and also to provide insights into the future research in this area. Drugs of plant origin are important in all these areas, although not usually for self-medication. They are also of historical interest; for example, the antipsychotic drug reserpine, isolated from Rauwolfia species, revolutionized the treatment of schizophrenia and enabled many patients to avoid hospitalization before the introduction of the phenothiazine and the newer atypical antipsychotics, in the same way Phytotherapy has a role in helping to re-establish a regular pattern of sleep which was disturbed by depression and anxiety.
Keywords: Anti-psychotic drug, stress, anti-psychological effects, schizophrenia etc.

Introduction
A mental disorder or mental illness is a psychological pattern or anomaly, potentially reflected in behavior, that is generally associated with distress or disability, and which is not considered part of normal development in a person’s culture. Mental disorders are generally defined by a combination of how a person feels, acts, thinks or perceives. This may be associated with particular regions or functions of the brain or rest of the nervous system, often in a social context.[1] According to the World Health Organization (WHO), over a third of people in most countries report problems at some time in their life which meet criteria for diagnosis of one or more of the common types of mental disorder. The causes of mental disorders are varied and in some cases unclear, and theories may incorporate findings from a range of fields. Services are based in psychiatric hospitals or in the community, and assessments are carried out by psychiatrists, clinical psychologists and clinical social workers, using various methods but often relying on observation and questioning. Clinical treatments are provided by various mental health professionals. Psychotherapy and psychiatric medication are two major treatment options, as are social interventions, peer support and self-help. Prevention is now appearing in some mental health strategies[1].

Various Types of Mental Disorders
There are many different categories of mental disorder, and many different facets of human behavior and personality that can become disordered. Anxiety or fear that interferes with normal functioning may be classified as an anxiety disorder [2]. Commonly recognized categories include specific phobias like,
- Generalized Anxiety Disorder,
- Social Anxiety Disorder,
- Mood Disorder, Panic Disorder,
• Agoraphobia,
• Obsessive-Compulsive Disorder
• Post-Traumatic Stress Disorder.
• Eating Disorders involve disproportionate concern in matters of food and weight

**Different Mental conditions:**
- Stress
- Insomnia
- Depression
- Anxiety
- Migraine
- Low memory

**Stress:**
Stress is a normal physical response to events that make you feel threatened or upset your balance in some way. Modern life is full of hassles, deadlines, frustrations, and demands [65].

**Anxiety disorders:**
Anxiety disorders are mental health conditions that involve excessive amounts of anxiety, fear, nervousness, worry, or dread. Anxiety that is too constant or too intense can cause a person to feel preoccupied, distracted, tense, and always on alert.

**Insomnia:**
Insomnia or sleeplessness is known as persistent falling asleep or staying asleep or poor quality sleep or trouble in sleeping. Sometimes not feeling refreshed after a night's sleep.

**Migraine:**
Migraine can be defined as a paroxysmal ailment, accompanied by a severe headache, generally on one side of the head, and associated with disorders of the digestion, the liver and the vision.

It usually occurs when a person is under great mental tension or has suddenly got over that state.

**Low memory:**
Low memory or Weak memory is very common in this present era due to stressful life conditions and day to day worries and hurries.

These psychological factors can be defined as abnormal states of mind characterized by: Impairment of General mental functions like perception and motor control in the absence of organic problems, mind control, hypothetical self-discussion, and critical analysis based on observations and different aspects of mind like decision, memory, orientation and responsiveness, conduct, psychomotor activity etc. [3].

**Depression:**
Depression is a state of low mood and aversion to activity that can have a negative effect on a person's thoughts, behavior, feelings, world view, and physical well-being.

Depressed people may feel sad, anxious, empty, hopeless, worried, helpless, worthless, guilty, irritable, hurt, or restless [2].

### List of Herbal drugs

<table>
<thead>
<tr>
<th>Sr.N</th>
<th>Name of drug</th>
<th>Parts used</th>
<th>Biological source</th>
<th>Family</th>
<th>Chemical constituents</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Hypericum</td>
<td>Dried aerial</td>
<td>Hypericum perforatum</td>
<td>Hypericaceae</td>
<td>Hypericin, hyperoside</td>
<td>Anti-depressant, anti-anxiety</td>
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<td>2</td>
<td>Brahmi</td>
<td>Herbs</td>
<td>Bacopa monnieri</td>
<td>Scrophulariaceae</td>
<td>Bacoside A, bacoside B</td>
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<td>Centella</td>
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<td>Asiaticoside, Madecassoside</td>
<td>Nervine tonic</td>
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<td>Valerian</td>
<td>Dried rhizomes</td>
<td>Valeriana officinalis</td>
<td>Valerianaceae</td>
<td>Valepotriates, Valerenic acid</td>
<td>Mild sedative, anti-anxiety</td>
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<tr>
<td>5</td>
<td>Curare</td>
<td>Barks &amp; Stem</td>
<td>Strychnoscastelnaei</td>
<td>Menispermacaeae</td>
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<td>6</td>
<td>Ashwagandha</td>
<td>Dried roots and stem</td>
<td>Withania somnifera</td>
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<td>Withanine, Somniferine, Somniferinine</td>
<td>Antidepressant, anti-Anxiety</td>
</tr>
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<td>Kava Kava</td>
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<td>Piper methysticum</td>
<td>Piperaceae</td>
<td>Kavalactones, methysticin</td>
<td>Antiseizure effects</td>
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<td>Ginkgo</td>
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<td>Ginkgo Biloba</td>
<td>Ginkgoaceae</td>
<td>Ginkgolide A, B, C</td>
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<td></td>
<td>Plant Name</td>
<td>Part Used</td>
<td>Scientific Name</td>
<td>Family</td>
<td>Active Constituents</td>
<td>Medicinal Activity</td>
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<td>9</td>
<td>Passionflower</td>
<td>Flower, fruits</td>
<td>Passifloraincarnata</td>
<td>Passifloraceae</td>
<td>Benzoflavone</td>
<td>Anti-anxiety and insomnia</td>
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<td>Ginseng</td>
<td>Dried roots</td>
<td>Panax ginseng</td>
<td>Araliaceae</td>
<td>Ginsenosides, panaxosides</td>
<td>Sedative activity</td>
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<td>11</td>
<td>Tulsi</td>
<td>Leaves</td>
<td>Ocimum sanctum</td>
<td>Labiatae</td>
<td>Eugenol, carvacrol, caryophyllin</td>
<td>Anti-stress</td>
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<td>12</td>
<td>Flannel weed</td>
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<td>B-phenethylamine, epedrine, pseudo-epedrine</td>
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<td>Eleutheroside B, friedelin, isoferaxidin</td>
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<td>Schizandrachinensis</td>
<td>Schisandraceae</td>
<td>Schizandrin, deoxy schizandrin, gomisins</td>
<td>Anti-stress</td>
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<td>Ligustrum</td>
<td>Dried seeds</td>
<td>Zizyphuli gustrum</td>
<td>Rhamnaceae</td>
<td>Linalool, terpineol, myrtenol</td>
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<td>Mimosa</td>
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<td>Albizijulibrissin,</td>
<td>Mimosoideae</td>
<td>2,6-dimethyl-6-O-beta-D-quinovosyl-2,7-menhiafoic acid, syringe resinol</td>
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<td>Stephania</td>
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<td>Stephaneicrebanineis, ocorydine, Stepharanin</td>
<td>Anti-psychotic</td>
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<td>Acorus</td>
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<td>Araceae</td>
<td>Asarone, asaraldehyde</td>
<td>As sedative, Tranquillising</td>
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<td>Echinacea purpurea</td>
<td>Compositeae</td>
<td>Arabinogalactan</td>
<td>Immunostimulant</td>
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<td>Fabaceae</td>
<td>Tannins, resins, starch, taraxerol&amp;taraxerone</td>
<td>Antioxytic, anticonvulsive, antistress</td>
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<td>Giloe</td>
<td>Dried leaves and stem</td>
<td>Tinospora cordifolia</td>
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<td>Tinnosporine, Tinnosporic acid, Tinnosporol</td>
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<td>Jatamansone, Nardostachone</td>
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<td>Farnesenechamazulen eapigenin, quercetincoumarin</td>
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<td>Methylchavicol methyl leugenollimononene, α-pinene</td>
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<td>Carvone, D-limonene</td>
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<td>Name</td>
<td>Part</td>
<td>Scientific Name</td>
<td>Family</td>
<td>Active Constituents</td>
<td>Pharmacological Actions</td>
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<td>Rosemary</td>
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<td>Lobeline, lobelane, methylamphetamine</td>
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<td>Reserpin, rescinnamine</td>
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<td><em>Evolvulus inoides</em></td>
<td>Euphorbiaceae</td>
<td>Xanthone, triterpenes</td>
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<td>Red Clove</td>
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<td>Anti-stress</td>
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<td>Atropine, hyoscyamine, scopolamine</td>
<td>Parasympathetic depressant</td>
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<td><em>Duboisia myoporoides</em></td>
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<td><em>Nicotiana tabacum</em></td>
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<td>Nicotine, nicotimine, nornicotine</td>
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<td>Latex</td>
<td><em>Papaver somniferum</em></td>
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<td>Stramonium</td>
<td>Leaf &amp; flowering tops</td>
<td><em>Datura stramonium</em></td>
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<td>Scopolamine, hyoscyamine</td>
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<td>Aerial parts</td>
<td><em>Convolvulus pluricaulis</em></td>
<td>Convolvulaceae</td>
<td>Shankhpushpine, kaempferol, beta-styroidal</td>
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<td>Ephedra</td>
<td>Dried aerial parts</td>
<td><em>Ephedra sinica</em></td>
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<td>Ephedrine, pseudoephedrine, norephedrine</td>
<td>CNS stimulants</td>
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<td>Cannabis</td>
<td>Dried flowering, fruiting</td>
<td><em>Cannabis sativa</em></td>
<td>Cannabinaceae</td>
<td>Cannabidiolic acid, tetra-hydrocannabinol</td>
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<td>Poppy latex</td>
<td>Latex</td>
<td><em>Papaver orientale</em></td>
<td><em>Papaveraceae</em></td>
<td>Morphine, codeine</td>
<td>CNS depressant</td>
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<td><em>Plantago</em></td>
<td>Leaves</td>
<td><em>Plantago asiatica</em></td>
<td><em>Plantaginaceae</em></td>
<td>Allantoin, aucubin, ursolic acid.</td>
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<td><em>Ilex pubescens</em> Hook</td>
<td>Stems</td>
<td><em>Ilex pubescens</em></td>
<td><em>Aquifoliaceae</em></td>
<td>Luteolin, quercetin, hyperoside, rutin</td>
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<td>Hoodwort</td>
<td>Dried Leaf</td>
<td><em>Scutellaria lateriflora</em></td>
<td><em>Lamiaceae</em></td>
<td>Cymbeline, humulene, calamenene</td>
<td>Anti-anxiety</td>
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<td>Hops</td>
<td>Rhizoms</td>
<td><em>Humulus lupulus</em></td>
<td><em>Cannabaceae</em></td>
<td>Myrcene, humulene, xanthohumol, myrcenol, linalool</td>
<td>Psychoactive effects</td>
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<td>Chamomile</td>
<td>Leaves</td>
<td><em>Matricaria chamomilla</em></td>
<td><em>Asteraceae</em></td>
<td>Luteolin quercetin rutin, polyacetylenes</td>
<td>Anti-anxiety, stress and insomnia</td>
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<tr>
<td>60</td>
<td>Lemon balm</td>
<td>Leaves</td>
<td><em>Melissa officinalis</em></td>
<td><em>Lamiaceae</em></td>
<td>Caffeic acid chlorogenic acid 3,5-dihydroxy cinnamic acid, geraniol, oleanolic acid</td>
<td>Anti-anxiety, stress and insomnia</td>
</tr>
</tbody>
</table>

**Detail of Some Medicinal Plants**

*Hypericum perforatum* (St. John’s Wort):

![St. John’s Wort Image]

**Biological source:**

It consists of dried aerial parts of the plant *Hypericum perforatum* belonging to family *Hypericaceae* [5]. St. John’s Wort has a history of medicinal use, particularly as a ‘nerve tonic’ and in the treatment of nervous disorders [11]. It is an aromatic perennial native of Europe [3, 23].

**Constituents:**

Hypericin was considered to be the antidepressant constituent of St. John’s wort, although experimental and clinical evidence has now emerged that hyperforin is a major constituent required for antidepressant activity[8,9,10].

**Pharmacological effects and clinical efficacy:**

The German monograph for St. John’s wort identifies hypericin, a purported monoamine oxidase (MAO) inhibitor, as the active ingredient in the herb. The hypericin content of St. John's wort is used as the basis for dosing. However, one U.S. study showed that pure hypericin does not bind to MAO. In this study, a crude St. John's wort extract exhibited significant receptor affinity for MAO, but the investigators stated that concentrations of the crude extract required for this activity are unlikely to be achieved after oral administration [20]. Hypericin, in a standardized extract has shown a significant antidepressant activity by inhibiting the enzyme mono amino oxidase (MAO). The antidepressant activity of Hyperforin is attributed to its inhibition of neuronal uptake of serotonin, norepinephrine and dopamine like many other antidepressants and also inhibits GABA and glutamate uptake [15]. The antidepressant activity of hypericum is not only limited to hypericin and hyperforin, xanthones of the plants are also reported to exhibit this property [12].
Dose:
When the aqueous methanolic extract of the herb was administered in the dose of 900 mg per day, for the duration of at least four weeks, the Hamilton Rating Scale for Depression (HRSD) was used as an outcome measure, slightly greater improvement in HRSD scores was obtained [5,11].

Toxicity:
St. John’s Wort has long been considered safer than the conventional pharmaceutical agents. However it's ability through its active constituent's hypericin, pseudohypericin and hyperforin, to induce P – glycoprotein/ MRD1 and both intestinal and hepatic CYP3A4 enzyme, could markedly reduce the distribution and disposition of their co-substrates [14]. St. John’s Wort is a potent uptake inhibitor of neurotransmitters serotonin, norepinephrine and dopamine all of which have a role in mood control [13]. It has been reported that St. John’s wort may be toxic during pregnancy and lactation in mice. There is considerable evidence that St. John's Wort can cause severe photosensitivity in animals grazing extensively on the plant [6]. In fact, the term "hypericism" has been used to describe a skin disease found in animals that graze on large quantities of St. John's Wort [9].

Uses: Anti-depressant and anti-anxiety [7].

**Bacopa monnieri (Brahmi)**

**Biological source:**
*Bacopa monnieri (Brahmi)* belonging to family *Scrophulariaceae*. It is an annual creeping plant found throughout India in wet, damp and marshy areas[5]. It is the important drug in Ayurveda for improvement of intelligence and memory and revitalizing of sense organs [23].

**Constituents:**
The main constituents present in *Bacopa monnieri* are saponins, bacoside A, bacoside B, monnierin and hersaponin, which are also responsible for the biological activity. Most of the work reported is on the alcoholic extract of the plant [5, 32, 54].

**Pharmacological effects and clinical efficacy:**
Administration of bacosides attenuated the retrograde amnesia produced by immobilization induced stress, electroconvulsive shock and scopolamine [55]. Treatment with the plant extract for one month reduced levels of anxiety, adjustment disability leading to improved mental functions. The protective action of B. Monnieri was demonstrated against phenytoin induced cognitive deficit. One of the marketed preparation contains the novel drug molecules, in experimental models increased protein kinase activity and new protein synthesis specifically in brain cells that are concerned with alertness, briskness and long term memory thereby resulting in the reduction of learning process. Another commercial preparation in a capsule form containing 500 mg of leaf powder is also claimed to improve the brain function and memory power in elderly people [24].

**Toxicity:**
Therapeutic doses of Bacopa monnieri are not associated with any known side effects, and Bacopamonnieri has been used safely in Ayurvedic medicine for several hundred years [55]. A double blind, placebo controlled clinical trial of healthy male volunteers investigated the safety of pharmacological doses of isolated bacosides over a four-week period [25].

**Dose:**
Concentrated bacosides given in single (20-30 mg) and multiple (100-200 mg) daily doses were well tolerated and without adverse effects [23].
Uses: Used as Memory enhancer and revitalizing of sense organs [26].

*Valeriana officinalis* (Valerian)

**Biological source:**
The root of *Valeriana officinalis* of family Valerianaceae has served thousands of years as a mild sedative. From 1820 until 1942, it was listed in the U.S. Pharmacopoeia as a tranquilizer [30]. It’s widely used and approved in Europe as a mild hypnotic to induce sleep and relieve anxiety [27]. In the United Kingdom, Valerian is also a popular and government approved sleep aid [28].

**Constituents:**
The main constituent of Valeriana is Valerenic acid and Valepotriates [5,55].

**Pharmacological effects and clinical efficacy:**
Valerian targets the same neuroreceptors as benzodiazepines. As per the study in 1993, Valerian and Humuluslupulus (Hops) are calming to the central nervous system and reduce depression and anxiety [29]. The mechanism of Valerian tends to sedate by stimulating activity of the nerve transmitter GABA that dampens the brain’s arousal system. Perhaps, Valerenic acid and Valepotriates, chemicals unique to Valerian sedate the brain cells responsible for arousal [30].

**Dose:**
Valerian extract in the dose of 400 to 900 mg decreases sleep latency and nocturnal awakenings and improved subjective sleep quality [31].

**Toxicity:**
Adverse effects of valerian are rare but include gastrointestinal upset, contact allergies, headache, restless sleep and mydriasis [29]. Valerian appears to be relatively safe in overdose with the major effect being central nervous system depression [31].

**Uses:** Mild sedative, tranquilizer and anti-anxiety.

*Withania somnifera* (Ashwagandha)

**Biological source:**
It consists of dried roots and stem bases of *Withania somnifera* belonging to family Solanaceae [5]. The plant is used as adaptogen since long time. The root is a nervine sedative and is used in doses of one gram in all cases of general debility nervous exhaustion, brain – fatigue and loss of memory [33].
Constituents:
The main constituent of ashwagandha is withanine. Some others alkaloids are somniferine, somnine, somniferine, withanamine, tropine, pseudotropine, anaferine, and anahydrine. The leaves contain steroidal lactone (withanolides-withaferin & withaferin A) [5, 54, 56].

Pharmacological effects and clinical efficacy:
Ashwagandha exhibited an antidepressant effect comparable to that induced by imipramine in the forced swim-induced “behavioral despair” and “learned helplessness” tests [35]. When the anxiolytic and antidepressant activity of W. Somnifera (dose 20 and 50 mg/kg) was compared with that of Lorazepam (0.5 mg/kg i.p.) And also with Imipramine (10 mg/kg i.p.), the herbal drug showed comparable results. Thus, W. Somnifera is an effective mood stabilizer in clinical conditions of anxiety and depression [46].

Dose:
A typical dose of ashwagandha is 3-6 grams daily of the dried root, 300-500 mg of an extract standardized to contain 1.5 percent withanolides, or 6-12 ml of a 1:2 fluid extract per day [34].

Toxicity:
Ashwagandha is generally safe when taken in the prescribed dosage range. Large doses have been shown to cause gastrointestinal upset, diarrhea, and vomiting [36]. Large doses of ashwagandha may possess abortifacient properties; therefore, it should not be taken during pregnancy. Since ashwagandha acts as a mild central nervous system depressant, patients should avoid alcohol, sedatives, and other anxiolytics while taking ashwagandha [37].

Uses: Antidepressant, anti-Anxiety and nerve sedative [5, 54, 36].

Piper methysticum (Kava)

Biological source:
It consists of dried roots and stem bases of Piper methysticum belonging to family Piperaceae. It is a shrub, native to Polynesia [5]. It has traditionally been taken by pacific Islanders as a beverage mixed with coconut milk and water. Most medicinal forms are either ethanol – water or acetone – water extracts [39]. Kava is marketed as a mild anxiolytic in European countries [37]. In the United States, kava is sold in health food stores as a natural alternative to anti-anxiety drugs and sleeping pills [40].

Constituents: Major chemical constituents are Kava lactones and methysticin [5, 54, 55].

Pharmacological effects and clinical efficacy:
The active constituents in Kava known as Kava pyrones have a variety of actions like inhibition of voltage – dependent sodium channels, increasing GABA-A receptor density, blocking norepinephrine reuptake and suppressing the release of glutamate. Kava lactones, the active principles in kava, are potent inhibitors of several of the CYP 450 enzymes, suggesting a high potential for causing pharmacokinetic interactions with drugs and other herbs which are metabolized by the same CYP 450 enzymes [39]. Some kava lactones have been shown to possess pharmacological effects, such as blockade of GABA receptors and sodium and calcium ion channels, which may lead to pharmacodynamics interactions with other substances, which possess similar pharmacological properties. Kava is as effective in treating forms of anxiety and the powerful tranquilizers known as benzodiazepines. Kava is not habit forming and does not reduce alertness [41].

Toxicity:
The side effects included oral and lingual dyskinesia, torticollis, and painful twisting movements of the trunk, oculogyric crisis and exacerbation of Parkinson's disease [40]. Kava has also been shown to have additive effects with central nervous system depressants. A patient who was taking alprazolam (Xanax), cimetidine (Tagamet) and terazosin (Hytrin) became lethargic and disoriented after ingesting kava [37].
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Uses: As Antiseizure and sleeping pills [5, 38].

_Ginkgo biloba_ (Ginkgo)

**Biological source:**
It consists of dried leaves of _Ginkgo biloba_ Linn belonging to family _Ginkgoaceae_. It is an ancient Chinese medicinal plant, which is now being cultivated in several countries including India [5]. A standard Ginkgo biloba extract of leaves contain 24 percent flavonoids and 6 percent terpenes, increases cerebral blood flow, especially in geriatric patients whose conditions include short-term memory loss [43].

**Constituents:**
The active ingredients of ginkgo leaf are various flavonol glycosides, which mainly include flavonol, mono-flavonol glycosides, and triglycosides of kaferol, and isorhamnetin. The leaves also contain diterpene lactone like ginkgolides A, B, C, & J and organic acids like 4-hydroxy benzoic acid and shikimic acid [5, 45, 56].

**Pharmacological effects and clinical efficacy:**
The extracts of Ginkgo biloba has anti-free radical properties in various in-vitro systems that may contribute to its efficacy in free radical induced cerebral insufficiencies. In a review of more than 40 controlled trial of Ginkgo showed that all but one found clinically significant improvements in symptoms such as memory loss, concentration difficulties, fatigue, anxiety and depressed mood [47].

**Dose:**
In a 52-week, randomized, double blind, placebo controlled multi-center study of more than 300 patients with Alzheimer’s disease or vascular dementia used the extract at a dosage of 120 mg a day [44].

**Toxicity:**
Side effects of Ginkgo extract are uncommon but include headache, gastrointestinal upset and allergic skin reactions and rarely cerebral hemorrhage [46].

Uses: Alzheimer’s disease [37].

_Panax ginseng_ (Ginseng)

**Biological source:**
It consists of dried roots of various species of _Panax ginseng_ belonging to family _Araliaceae_ [5]. It is a commonly used herb in maintaining emotional balance [49].

**Constituents:**
Ginseng contains a mixture of several saponin glycosides, belonging to triterpenoid group like ginsenosides, panaxosides, and chikusetsusaponin. The main constituents of ginseng is oleanolic acid [5, 54, 56].
Toxicity:
Side effects with either type of ginseng are rare. There are a few case reports of breast tenderness, postmenopausal vaginal bleeding, and menstrual abnormalities associated with Panax ginseng. Combination treatment with Panax ginseng and antidepressant drugs may result in a manic episode [51].

Uses: As Sedative and also maintainemotional balance [53].

Leonurus cardiaca (Motherwort)

Biological source:
It consists of dried aerial parts of Leonurus cardiaca belonging to family Labiatae. The herb is collected during flowering period. It is native to Siberia and found generally throughout Europe [5].

 Constituents:
The major constituents of motherwort are flavonoids, iridoids, terpenoids and tannins. Flavonoids include hyperosides, kaeverol-3-D-glucosides, quercitrin. Iridoids include leonuride. Diterpenes contains leocardinetc [5, 56].

Pharmacological effects and clinical efficacy:
It is also known as ‘heart herb’. It increases blood circulation in the brain. In the 17th century, it was recommended by the herbalist Nicholas Culpeper to prevent melancholy. In modern time, it has been studied in Germany where it was recognized as having a mild sedative effective for treating anxiety and sleep disorders. Modern herbalists report that it helps to alleviate depression especially when combined with other antidepressant herbs [37]. A single application of motherwort extract (concentration not reported) in excess of 3 grams may cause diarrhea, uterine bleeding, and stomach irritation. It should be avoided in pregnancy as large amounts may cause uterine contraction and potential miscarriage. The investigational studies suggest that kava might have additive effects with benzodiazepines, given that they act on the same receptor and on the same areas of the central nervous system with increased GABA receptors [48].

Toxicity:
Adverse effects of Leonurus cardiaca are rare but include gastrointestinal upset, contact allergies, headache, restless sleep and mydriasis. Valerian appears to be relatively safe in overdose with the major effect being central nervous system depression [28].

Uses: As Anti-anxiety [5].

Centella asiatica (Mandukaparni)

Biological source:
Drug consists of the dried aerial parts, preferably leaves of Centella asiatica belonging to family Apiaceae. It is distributed throughout the tropical and subtropical regions of India [5,56].
The plant is a ‘rasayana’ in Ayurvedic medicine; it enhances the immune system and is considered to have a rejuvenating, neurological ‘tonic’ and mild sedative effect [23,66].

**Constituents:**
Tri-terpenoidsaponins; madecassoside and asiaticoside and their aglycones; Asiatic acid and madecassic acid. Madecassoside 0.7 – 5.0 %; Asiaticoside 0.1 – 0.6 %; Asiatic acid 0.1 – 0.5 % and Madecassic acid 0.5 – 0.8 % are major constituents [5].
While saponins; asiaticoside B, brahminoside, centelloside, indeentelloside, thankuniside and isothankuniside; triterpenoids acids; brahmic acid, isobrahmic acid, betulic acid, centic acid and centoic acid; flavonoid glycosides; 3-glucosylquercetin and 3-glucosylkaempeferol and an alkaloid hydrocotyline are some of the minor constituents [54, 56,69].

**Pharmacological effects and clinical efficacy:**
Aqueous extract of fresh leaves has effect on learning, memory and biogenic amine turnover in albino rats and the effect is dose dependent. In double blind clinical trial conducted on 30 mentally retarded children who were free from epilepsy and other neurological conditions to study effects of C. Asiatica on general mental ability, significant improvement in general ability and behavior pattern was observed after administering the drug for a period of 6 weeks. The indigenous drug Geriforte (brand name) contains C [22]. Asiatica as one of the constituents, has been found to impart protective and antifatigue effects on stressed rats and also an excellent nerve tonic in decline age [64].

**Toxicity:**
Contact dermatitis has been observed due to madecassol. Triterpene glycosides have been identified as having oncogenic activity and asiaticoside has been implicated as a possible carcinogen where repeated applications are used [22, 23].

**Contraindication:**
In most cases, the herb, its extract or its preparations are not recommended for use in the children under age 12, pregnant or lactating women [21].

**Uses:**
- It has beneficial effect on behavior learning and memory.
- Nervine tonic.
- The plant is traditionally considered as a tonic in diseases of nerves and blood and for improving memory.
- The plant is especially used in the treatment of amnesia and hysteria. [5,54,56]

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