Sheel Sharma. *et al*. / *International Journal of Pharmacy & Therapeutics*, 2(1), 2011, 24-36.

ISSN 0976-0342
2229-7456

International Journal of Pharmacy & Therapeutics

Journal homepage: www.ijptjournal.com

IJPT

A REVIEW ON HERBS WITH ANTIDEPRESSANT PROPERTIES

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ABSTRACT

Since the dawn of civilization, plants have been the basis of a medicine and a major resource for human health care for curative and palliative functions. Man in today times has always been in quest of that herb that heals the body and soothes the mind as stress has begun to become a part and parcel of modern day life. Medicinal plants have been used to treat such psychotropic and behavioural conditions as anxiety, depression, seizures, poor memory, dementia, insomnia and drug intoxication. There have been limited studies on herbs having antidepression property. The aim of this article is to review the medicinal plants having such components that help in treating stress, psychotropic and behavioural disorders. A number of species and genera have been identified that are in use for treating such ailments directly or indirectly. However, further studies need to be conducted to explore and provide scientific credence to the folklore traditional use of medicines that could become helpful in developing effective green remedies sans side effects.

Key words: Medicinal plants, Depression, Stress.

INTRODUCTION

Stress is inevitable in life. Many events occurring in daily life bring challenges that impinge upon our minds, bodies and emotions to different extents subjecting us to stress of various types namely mental, physical and emotional. The term 'stress' generally points towards an internal (i.e., infection, psychological condition) or external (i.e., physical danger or damage) circumstance that threatens the homeostasis of the organism. Thus stress results in a discrepancy, either real or perceived, between the demands of a situation and the organism's resources (Cota, 2008). These circumstances/factors that produce stress are called stressors. Stressors are the cause, stress is the effect. There are two type of stress, the first eustress or enabling–where stressors producing eustress enhance longevity, productivity and life satisfaction e.g. stress of examination, exercise. Likewise, unpleasant stress is called distress and results in maladaption, sickness and even death; for instance - stress of chronic pain, lack of meaningful relationship and living in an unpleasant environment (Sharma, 2008). Some of the disorders associated with stress are anxiety, high blood pressure, headache, depression, weakened immune system, high cholesterol level, sleeplessness, impotence, diarrhoea, loss of heightening appetite, cancer, respiratory disorders, accidental injuries, cirrhosis of liver, and attempted suicide etc. Throughout history, many drugs all over the world have been used to alleviate stress, anxiety and depression. Now a days, the sale of drugs like Paxil, Prozac, Effexor, Cymbalta, and Zoloft have skyrocketed for treating stress. But these drugs don't solve the problem. Infact, these have various unpleasant side effects like fatigue, weight gain, digestive system upset, insomnia and sexual dysfunction. One of the leading drugs used to treat anxiety even lists anxiety as one of its side effects. Since time immemorial, plants have been used in treatment of various ailments due to having bio active compounds and these plants may serve the same purpose without causing side effects. Therefore, the present review would lead us into theorising that plants have stress treating/reducing potential. Reviewed here under is the role of various plant types in stress related and depressive disorders.

1. Withania somnifera

Withania somnifera (Ashwagandha), often referred to as the "Indian Ginseng", belongs to family Solanaceae. It grows prolifically in India, Nepal, Pakistan, Sri Lanka and Bangladesh. It contains various alkaloids and anoloides. They work as stimulants for the immune system (El and Karakava, 2004). Among the various alkaloids, withanine is the main constituent. The other

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alkaloids are somniferine, somnine, somniferinine, withananine, pseudo-withanine, tropine, pseudo-tropine, cuscohygrine, anferine and anhydrine. The leaves contain steroidal lactones, which are commonly called withanolides. Withania somnifera possesses anti-inflammatory, antitumor, antistress, antioxidant, immunomodulatory, hemopoietic, and most rejuvenating properties. It also exerts a positive influence on the endocrine, cardiopulmonary and central nervous systems (Mishra *et al*., 2000).

Withania somnifera appears to have powerful antioxidant activity that may reduce the impact of oxidative damage on neurological function (Bhattacharya *et al*., 2001). Traditionally, it has been used to treat debility, emaciation, and impotence as well as to prevent premature aging (Boone, 1998). It is a general tonic to be used in stressful situations and is especially useful for insomnia, nervousness, and restlessness. It works with the brain to create calming neurotransmitters. Extracts of Withania somnifera have GABA-like activity (Mehta 1991). This accounts for this herb's anti -anxiety effects. The adaptogenic properties of Withania somnifera is attributed in part to its effects on the output of adrenal hormonals (Singh *et al.*, 2000)

2. Ocimum sanctum

Ocimum sanctum is commonly known as basil, belongs to the family Labiatae. It contains a volatile oil consisting of about 70% eugenol as well as methyl eugenol and caryophyllene (Agrawal *et al*., 1996). Other constituents include the triterpenoid ursolic acid, rosmarinic acid, alkaloids, saponins, flavonoids (including apigenin and luteolin and glycosides thereof), phenylpropane glucosides and tannins (Devi *et al*., 1998; Kelm *et al*., 2000; Balanehru and Nagarajan, 1991). The seeds of Ocimum sanctum contain a fixed oil containing five fatty acids, including about 17% linolenic acid and just over 50% linoleic acid (Platel and Srinivasan, 1996; Bai and Xu, 2000). Traditional uses include rejuvenating, tonic and vitalising properties that contribute to longevity and a healthy life, as well as anti-septic, anti-allergic and anti-cancer effects (Shankaracharya *et al*., 1997; Reen *et al*., 1996). Ocimum sanctum possesses multiple pharmacological effects including immuno-modulating, anti-stress, hepatoprotective, chemopreventive, and anti-inflammatory. Ocimum sanctum reduces stress, enhances stamina, relieves inflammation, lowers cholesterol, eliminates toxins, protects against radiation, prevents gastric ulcers, lowers fevers, improves digestion and provides a rich supply of antioxidants and other nutrients. It is especially effective in supporting the heart, blood vessels, liver and lungs and also regulates blood pressure and blood sugar. It is also useful in improving the body's overall defence mechanism including its ability to fight viral diseases (Sampath *et al*., 2010). Ocimum sanctum, is classified as an "adaptogen," which means that it enhances the body's physiological capacity to respond to stress factors. As a result, the troublesome effects of chronic stress - such as nervousness, sleeplessness, and digestive disorders, can be minimized. Ocimum sanctum is considered as an agent for treatment of a variety of conditions including pain, fever, vomiting, bronchitis, earache and diseases of the heart and blood (Atal *et al*., 1981) along with diabetes mellitus, arthritis and asthma (Evans, 1996). The leaf juice has been used for chronic fever, haemorrhage, dysentery and dyspepsia and also as an anthelminthic and topical application for ringworm and skin diseases (Samuelsson, 1999). It also improves resistance to different types of stressors such as behavioural despair, induced gastric ulcers, and exposure to hepatotoxins (Bhargava and Singh, 1981; Mandal *et al*., 1993).

3. Bacopa monniera

Bacopa monniera is commonly known as 'Brahmi'; family – Scrophulariaceae. It contains alkaloid brahmine, nicotinine, and herpestine (Sastri *et al*., 1959; Chatterji *et al*., 1965). The major chemical responsible for the memory-facilitataing action of Bacopa monniera is Bacosides A (Chatterji *et al*., 1965). It is a traditional treatment for epilepsy and asthma. It has antioxidant properties, reducing oxidation of fats in the bloodstream. Extract of the plant has antianxiety effects and improves memory capacity and motor learning ability (Rajani *et al*., 2004).

In India, this plant has also been used traditionally to consecrate newborn babies in opening the gateway of intelligence. It improves intellectual activity (Stough *et al*., 2001; Roodenrys *et al*., 2002; Stough *et al*., 2008). It is used in breathing therapy to accelerate trauma release and make continuous breathing easier. Bacopa monnieri is a well known nootropic plant reported for its tranquilizing, sedative, cognition enhancing, hepatoprotective and antioxidant actions. Fresh Bacopa monniera juice has significant antiulcerogenic activity (Rao *et al.*, 2000). Extracts of the plant possess anti-cancer activity as it inhibits sarcoma-180 cell growth (Elangovan *et al*., 1995). Bacopa monniera is a 'brain tonic' capable of improving mental ability, anxiety and memory. Aside from increasing intellectual and cognitive functions, it induces a sense of calm and peace in its users. It is unique in its ability to invigorate mental processes whilst reducing the effects of stress and nervous anxiety. Additionally, it helps soothe the restlessness and distraction that nervousness causes.

4. Piper methysticum

Piper methysticum (Common name: Kava; family: Piperaceae) is a shrub that grows on many islands throughout the South Pacific, including Hawaii. It contains a psychotropic active principle (Schulz *et al*., 1998). The active constituents in the roots, kava lactones, have relaxing and intoxicating properties. This plant's root contains kavalactones upto an extent of 15% of the root mass produce physical and mental relaxation and feelings of well-being, without causing addiction or harmful side effects. Also known as kavapyrones, they have anxiolytic, analgesic, anticonvulsant, muscle relaxant effects, and local anaesthetic properties too (Schulz *et al*., 1998; Singh, 1983; Singh and Blumenthal, 1997).

This active principle is prescribed for those with diagnosed anxiety and also helpful in relieving the everyday stress & strain of a fast-paced lifestyle as it is

noted for promoting relaxation while leaving mental acuity intact, it is particularly useful for management of daytime anxiety (Singh and Blumenthal, 1997; Brown, 1996). Piper methysticum also promotes normal, restful sleep, and helps relax skeletal muscles.

The kava extract is proved "as a treatment alternative to tricyclic antidepressants and benzodiazepines in anxiety disorders, with proven long-term efficacy." The herb is used in reduction in anxiety symptoms including feelings of nervousness and somatic complaints such as chest pain, dizziness, gastric irritation, headache, and heart palpitations (Kinzler *et al*., 1991). Piper methysticum has positive effects for conditions involving anxiety including PMS and menopausal complaints, as well as for drug addiction and withdrawal symptoms (Norton, 1998; Warnecke, 1991)

5. Centella asiatica

Centella asiatica (Common name : Gotu kola ; Family: Apiaceae) is a perennial plant native to India, Japan, China, Indonesia, South Africa, Sri Lanka, and the South Pacific. It is a tasteless, odorless plant that thrives in and around water. Active principles are pentacyclic tirterpenes, namely - asiatic acid, asiaticoside, madecassic acid and madecassoside. It contains triterpenoids, compounds that have been shown to aid in wound healing. Historically, Centella asiatica has also been used to treat syphilis, hepatitis, stomach ulcers, mental fatigue, epilepsy, diarrhea, fever, and asthma. Now it is used for disorders that cause connective tissue swelling, such as scleroderma, psoriatic arthritis (arthritis occurring in conjunction with psoriasis), anklylosing spondylitis (arthritis of the spine), and rheumatoid arthritis. Traditional uses for Centella asiatica are lowering high blood pressure, treating venous insufficiency (pooling of blood in the veins, usually in the legs, boosting memory and intelligence, easing anxiety and speeding wound healing. It helps in stress coping and reduces anxiety, as well as boosts immunity. Triterpenoids (active compounds in Centella asiatica) have been shown to soothe anxiety and boost mental function. Centella asiatica is a mild adaptogen, antibacterial, anti-viral, anti-inflammatory, anti-ulcerogenic, anxiolytic, a cerebral tonic, a circulatory stimulant, a diuretic and nervine (Winston & Maimes, 2007). Juice is used as a general tonic for good health. Centella asiatica stimulates maturation of the scar by the production of type I collagen. The treatment also results in a marked decrease in inflammatory reaction and myofibroblast production (Widgerow and Laurence, 2000). The isolated steroids from the plant have been used to treat leprosy (Hausen, 1993). In addition, it has nootropic effects (Bradwejn *et al*., 2000 and used to re-vitalize the brain & nervous system, increase attention span & concentration (Brinkhause *et al*., 2000) and combat aging (Bradwejn *et al*., 2000) It also has anti-oxidant properties (Winston and Maimes, 2007) and works for venous insufficiency .

6. Tanacetum parthenium

Tanacetum parthenium (common name: feverfew) belongs to family compositate (Asteraceae, Matricaria or Daisy). It is used by the ancient Greeks and early Europeans to treat fevers, repel insects and treat bites and stings. It is highly popular in British, French and Canadian phytomedicine and used to prevent migraine headaches, relieve menstrual cramps and treat painful joints (Awang, 1997; Awang, 1989). It contains sesquiterpene lactones, flavonoid glycosides, pinenes and other compounds (Hobbs, 1989; Bohlmann and Zdero, 1982; Hendriks *et al*., 1996; Berry, 1984). Parthenolide is the most abundant sesquiterpene lactone and is the most active chemical constituent in the plant (Groenewegen *et al*., 1986). The flavonoid glycosides have vasodilating and anti-inflammatory effects, and pinenes have mild sedative characteristics (Bohlmann and Zdero, 1982; Groenewegen *et al*., 1986; Knight, 1995; Williams *et al*., 1995; Williams *et al*., 1999). It calms the nerves and relieves migraines. Tanacetum parthenium is helpful with anxiety-induced headaches. It works through four different mechanisms: reducing inflammation, reducing platelet activation, minimizing damage to endothelium, and modulating vasoconstriction (Biggs *et al*., 1982). It is commonly used for headaches with an added use for arthritis, menstrual discomfort, and a variety of other disorders. Tanacetum parthenium inhibits prostaglandin synthesis and histamine release from mast cells, affect platelet activity, and/or inhibit vascular smooth muscle contractility.

7. Ginkgo biloba

Ginkgo biloba (Family: Ginkgoaceae) has been used in traditional medicine to treat circulatory disorders and enhance memory. It also enhances memory in older adults. Ginkgo biloba improves blood circulation by dilating blood vessels and reducing the stickiness of blood platelets. Extracts of Ginkgo biloba leaves contain flavonoid glycosides and terpenoids (ginkgolides, bilobalides) and has three effects on the human body: improvement in blood flow (including microcirculation in small capillaries) to most tissues and organs; protection against oxidative cell damage from free radicals; and blockage of many of the effects of platelet-activating factor (platelet aggregation, blood clotting (Smith *et al*., 1996) that have been related to the development of a number of cardiovascular, renal, respiratory and central nervous system disorders. Ginkgo biloba leaf extract is beneficial in treating neurodegenerative diseases like Alzheimer's, cardiovascular diseases, cancer, stress, memory loss, tinnitus, geriatric complaints like vertigo, age-related macular degeneration, and psychiatric disorders like schizophrenia (Ramassamy *et al*., 2007). Ginkgo biloba has nootropic properties, and is mainly used as memory (Mahadevan, 2008) and concentration enhancer, and anti-vertigo agent. Ginkgo biloba is also used for intermittent claudication.

Ginkgo biloba is beneficial in multiple sclerosis, showing modest improvements in cognition and fatigue (Lovera *et al*., 2007) without increasing rates of serious adverse events in this population. It is an effective treatment for arresting the development of vitiligo (Parsad *et al*., 2002). Ginkgo biloba improves circulation to the brain. It elevates the mood for those depressed. It is rich in flavonoids that neutralize free radicals, the seeds (nuts) treat pulmonary disorders (like asthma, cough and

enuresis), alcohol abuse, and bladder inflammation while the leaves are mainly used to treat heart and lung dysfunctions and skin infections (Mahady 2002; Smith and Luo 2004). Stress involves a rise in the levels of glucocorticoids, and a subsequent memory dysfunction, increased anxiety, decreased immunity, gastrointestinal tract disturbances, myocardial infarction, or effects such as increased vigilance (Walesiuk *et al*., 2005). Since mood and emotion are related to stress, the alleviating effects of Ginkgo leaf extract results in improving mood, thus resulting in antidepressant activity (DeFeudis and Drieu 2004).

8. Leonurus cardiaca

Leonurus cardiaca (Motherwort) is an herbaceous perennial plant in the mint family, Lamiaceae. The herb contains the alkaloid leonurinewhich is a mild vasodilator and has a relaxing effect on smooth muscles. For this reason, it has long been used as a cardiac tonic, nervine, and an emmenagogue. Among other biochemical constituents, it also contains bitter iridoid glycosides, diterpinoids, flavonoids (including rutin and quercetin), tannins, volatile oils, and vitamin A. Leonurus cardiaca herbs synthesize flavonoids, alkaloids, iridoids, diterpenoids, cardenolids such as glycosides, tannins and other constituents in lower amounts (Papanov *et al*., 1998; Papanov *et al*., 1998).

Traditionally, it is used as a remedy for healing nervous and functional cardiac disorders (Milkowska-Leyck *et al*., 2002), and now for producing sedative, hypotensive and cardiotonic pharmacological effects components as a superior antispasmodic and nervine. Leonurus cardiaca is used for healing cardiac diseases in Germany, France, Russia, Hungary, Bulgaria and some other countries (Mills *et al*., 2000). Leonurus cardiaca is predominantly a womb remedy. A combination of relaxant and uterotonic effects induced by alkaloids (stahydrine, etc.) gives motherwort a useful role in facilitating child-birth. Leonurus cardiaca is used to stimulate heart function, especially in conditions when the heart is weak (Mills *et al*., 2000).

9. Valeriana officinalis

Valeriana officinalis (Valerian), a member of the Valerianaceae family is a perennial plant native to Europe and Asia and naturalized in North America (Wichtl, 1994). The volatile oil contains valerenic acids; the less volatile sesquiterpenes; or the valepotriates (esters of short-chain fatty acids) Valeriana officinalis is used for insomnia and other disorders. It is a sedative for nervous tension, hysteria, excitability, stress and intestinal colic or cramps (Hedley and Petry, 2003; Schmitz and Jackel, 1998). Valeriana officinalis is used against sleeping disorders, restlessness and anxiety, and as a muscle relaxant. Valeriana officinalis is also used traditionally to treat gastrointestinal pain and irritable bowel syndrome. Valeriana officinalis has uses in herbal medicine as a sedative. The main current use of valerian is as a remedy for insomnia. Valeriana officinalis root is used to treat myriad disorders including heart palpitations, digestive problems, epilepsy and urinary tract infections (Brown, 1996; Flynn and Roest, 1995). Other common uses include the treatment of headaches, anxiety, palpitations, high blood pressure, irritable or spastic bowel, menstrual cramps, epilepsy, childhood behavior problems and learning disabilities (Klich, 1975; Hoffman, 1996). It has also been included in herbal remedies for cardiovascular disorders to help reduce hypertension and reduce the effects of stress and tension on the heart (Mowrey, 1986; Straube, 1968; Drozdov, 1975).

10. Passiflora incarnata

Passiflora incarnata (Common name: passion flower; family: Passifloraceae) is a perennial creeping vine, native to the tropical and semi-tropical southern United States, Mexico, and Central and South America, now cultivated in tropical and subtropical regions, including Florida, Guatemala, and India. A group of harman alkaloids and flavonoids are the active constituents responsible for its relaxing and anti-anxiety effects (Meier, 1995). Passiflora incarnata contains 0.82.5% apigenin and luteolin glycosides, vitexin, isovitexin and their C-glycosides, kaempferol, quercetin, and rutin; indole alkaloids (0.010.09%), mainly harman, harmaline, harmine; coumarin derivatives; cyanogenic glycosides (gynocardin); fatty acids (linoleic and linolenic); gum; maltol; phytosterols (stigmasterol); sugars (sucrose); and a trace of volatile oil (Bradley, 1992; Bruneton, 1995; Leung and Foster, 1996; Newall *et al*., 1996; Wichtl and Bisset, 1994). It also has phenolic, fatty, linoleic, linolenic, palmitic, oleic and myristic acids, as well as formic and butyric acids, courmarins, phytosterols and essential oil. In Germany, Passiflora incarnata is used as a component of prepared sedative (in combination with lemon balm and valerian root) and cardio tonic (in combination with hawthorn) (Bradley, 1992; Leung and Foster, 1996; Wichtl and Bisset, 1994). It is also used in German homeopathic medicine to treat pain, insomnia related to neurasthenia, and nervous exhaustion (Der Marderosian, 1999). The effects of Passiflora incarnata are believed to be primarily on the nervous system, particularly for anxiety due to mental worry and overwork (Foster, 1996). In common usage Passiflora incarnata is a popular herb for nervousness, anxiety, reducing pain and inducing sleep. It is frequently used as an antispasmodic for spasms, epilepsy, menstrual pain, spasmodic coughing and asthma.

11. Nepata cataria

Nepata cataria (Catnip) is a perennial herb belonging mint family (Labiatae) (Hatch, 1972; Jackson & Reed, 1969). The constituents of Nepata cataria are flavonoids, phenolic compounds, essential oil-containing monoterpenes, terpenoids, and sterols (Ganzera *et al*., 2001; Chauhan *et al*., 2005; Klimek and Modnicki, 2005; Modnicki *et al*., 2007; Heuskin *et al*., 2009). Although the main constituent of Nepata cataria is nepetalactone, the most active constituent is a metabolic product of this, nepetalic acid (Harney *et al*., 1974; Waller *et al*., 1969). In traditional use, Nepata cataria is believed to have sedative, carminative, and antispasmodic properties. It has also been used traditionally to treat colds, flu, and fevers (Tucker and Tucker, 1988; Grognet, 1990). The tea and infusion is used for nervous problems. It has a soothing effect and has

been used to treat nervous headaches, hysteria, and insanity (Bolyard, 1981; Hutehens, 1969, De Bairach Levy, 1974). Nepata cataria is used both as a mild stimulant and for its quieting effect on the nervous system (Hutehens, 1969; Benoforado, 1969). Nepata cataria is a remedy for infantile colic (antispasmodic) and flatulence (carminative) (Krochmal & Krochmal, 1973; Bolyard, 1981; Wren, 1956). It also cures hiccups (De Bairach Levy, 1974). The tea is used as an emmenagogue to induce menstruation (Bolyard, 1981; Wren, 1956; Hutehens, 1969).

12. Matricaria chamomilla

Matricaria chamomilla L., known as "chamomile", is a flowering plant in the Daisy family. It is native to Europe and Asia. Major secondary components from Matricaria chamomilla belong to three different chemical classes: sesquiterpenes, coumarins, and flavonoids (Schilcher, 1987). The major components of the essential oil are (-)-R-bisabolol and R-farnesene, and the yield of the essential oil from the flowers are about 0.4%. This plant also has high levels of polyphenolic compounds such as coumarins and flavonoids. The coumarins herniarin, umbelliferone, and esculetin make up approximately 0.1% of the total constituents. Other major constituents of the Matricaria chamomilla flowers include several phenolic compounds, primarily the flavonoids apigenin, quercetin, and patuletin as glucosides and various acetylated derivatives (Svehlikova *et al.*, 2004; Avallone *et al*., 2000). The principal components of the essential oil extracted from the flowers are the terpenoids R-bisabolol and its oxide, azulenes, including chamazulene and acetylene derivatives (Ganzera *et al*., 2006). Matricaria chamomilla is one of the richest sources of dietary antioxidants. The unique medicinal effect of chamomile results from combined action of all inherent substances: sesquiterpenes [(-)-α- bisabolol, matricin or chamazulene], flavonoids (apigenin glucosides), polyacetylenes [(Z)-ene-ynedicycloether], coumarins (herniarin and umbelliferone), mucilages, etc. (Schilcher 1987). Matricaria chamomilla has been used to treat various inflammations, irritations, and pains such as skin diseases, wounds, eczema, ulcers, gout, neuralgia, and rheumatic pains (Mckay & Blumberg, 2006 ; Srivastava & Gupta, 2007). Matricaria chamomilla plant extract suppresses the growth of human cancer cells and causes apoptosis (Srivastava & Gupta, 2007). As a traditional medicine, it is used to treat wounds, ulcers, eczema, gout, skin irritations, neuralgia, sciatica, rheumatic pain, hemorrhoids, mastitis, and other ailments (Tyler, 1993). On the basis of its broad-spectrum anti-inflammatory, antioxidant, and mild astringent properties, German Commission E has approved Matricaria chamomilla for use for inflammation of the skin and mucous membranes and for various bacterial infections of the skin, oral cavity, gums, and respiratory tract (Blumenthal *et al*., 1998). Matricaria chamomilla, in the form of aqueous extract, has been frequently used as a mild sedative to calm nerves and reduce anxiety and to treat hysteria, nightmares, insomnia, and other sleep problems. Matricaria chamomilla has been valued as a digestive relaxant and has been used to treat various gastrointestinal disturbances, including flatulence, indigestion, diarrhea, anorexia, motion sickness, nausea, and vomiting (Tyler, 1993; Forster *et al*., 1980). Other purported actions of this herb include antiulcer, antibacterial, liver stimulatory and antimycotic effects (Achterrath, 1980; Anderson *et al*., 2000). In children, Matricaria chamomilla has been used to treat colic, croup, and fevers. In women, it has been used as an emmenagogue and a uterine tonic. Chamomile's essential oil is also used as a treatment for malaria and parasitic worm infections, cystitis, colds, and flu (Anderson *et al*., 2000; Avallone *et al*., 1996).

13. Eschscholzia californicas

Eschscholzia californicas (California poppy) belongs to family: Papaveraceae. Eschscholtzia californica contains isoquinoline alkaloids, (Gertig, 1965; Dopke & Fritsch, 1970) the most important of which are protopine, chelidonine, chelerythrine, (Granger *et al*., 1992) macarpine, cryptopine, allocryptopine, and sanguinarine (Kutchan, 1996). Other alkaloids identified in Eschscholtzia californica are 10-OHsanguinarine, 12-OH-chelirubine and 10-OH-chelerythrine (benzophenantridine), and 10-OH-dihydrosanguinarine and 12-OH dihydrochelirubine (dihydrobenzophenantridine) (Tanahashi & Zerk, 1990). Eschscholzia californicas is most commonly used to relieve toothaches by cutting the root and applying the juices directly. As a tea, Eschscholzia californicas is used for headaches, anxiety, and sleeplessness. Eschscholzia californicas also appears to be useful for mild cases of colic, sleeplessness, tension, and anxiety in children. Eschscholtzia californica is used, either alone or in association with other plant medicinals (passion flower, valerian, lemon balm), in the treatment of anxiety and to induce sleep in patients affected with insomnia (Schafer *et al*., 1995). Eschscholzia californicas has a sedating effect on the central nervous system and a relaxing effect on the smooth musculature of the ileum (Vincieri *et al*., 1988). Compounds present in the hydroalcoholic extract of Eschscholtzia californica inhibit enzymatic degradation and the neosynthesis of catecholamines. Both dopamine β-hydroxylase and monoamine oxidase B are inhibited by Eschscholtzia californica extract, (Kleber *et al*., 1995) and this explains the part of its sedative and soporific effect. It is commonly used in toothpastes and mouthwashes for bacterial plaque. Sanguinarine also has a positive inotrope activity and inhibits many enzymes (ATPase, diamine oxidase, aminotransferase) (Harborne, 1993).

14. Melissa officinalis

Melissa officinalis (Lemon balm) is a perennial herb in the mint family Lamiaceae, native to southern Europe and the Mediterranean region. The leaves contain rosmarinic, caffeic, protocatechuic acids, phenolic compounds, flavonoids and these chemicals may contribute the major portion of the herb's beneficial effects (Ziakova, 2003; Patora *et al*., 2002).The main components of the essential oil are citral, citronellal and linalool. Melissa officinalis has low essential oil content (among 0.05 and 0.12 % vol.) (Blum & Lorenz, 2005). Melissa officinalis contains eugenol which kills bacteria and has

been shown to calm muscles and numb tissues. It also contains tannins that contribute to its anti-viral effects, as well as terpenes that add to its soothing effects. Traditionally this herb has been used as a sedative, and as an antispasmodic. It is claimed to have antibacterial, antiviral properties (it is effective against herpes simplex (Kucera *et al*., 1965; Allahverdiyev, 2004; Schnitzlera *et al*., 2008). It is also used as an anxiolytic, mild sedative or calming agent. Melissa officinalis also has been shown to be effective in reducing stress. (Pizzorno & Murray, 2006) Melissa officinalis extract was identified as a potent inhibitor of GABA transaminase, which explains anxiolytic effects. The major compound responsible for GABA transaminase inhibition activity in Melissa officinalis is rosmarinic acid.

Melissa officinalis and preparations thereof also improve mood and mental performance. These effects involve muscarinic and nicotinic acetylcholine receptors (Kennedy *et al*., 2003). The extract of Melissa officinalis has exceptionally high antioxidant activity (Keyvan *et al*., 2008). Melissa officinalis exhibits antithyrotropic activity, inhibiting TSH from attaching to TSH receptors, hence making it of possible use in the treatment of Graves' disease or hyperthyroidism. Melissa officinalis is a good source of antioxidants (Blomhoff, 2004). Melissa officinalis has benefits on lowering the risk of certain cancers (De Sousa *et al*., 2004) Melissa officinalis is used as a mild sedative and/or calming agent (Kennedy, 2004). High dose of encapsulated dried Melissa officinalis leaf improved memory performance and Â“calmnessÂ” significantly (Kennedy *et al*., 2003; Kennedy, 2002). Melissa officinalis ameliorates the negative mood effects of the Defined Intensity Stressor Simulation, with significantly increased self-ratings of calmness and reduced self-ratings of alertness.

15. Lavandula angustifolia

Lavandula angustifolia (Lavender) is a mint native to the Mediterranean regions. Linalool, a component of lavender oil, is its active component. Lavandula angustifolia oil is rich in linalyl acetate, geraniol and cineole. The essential oil of Lavandula angustifolia has been used traditionally to treat many disorders, including pain, such as headaches, rheumatism, muscular aches, labour pains and period pains (Lawless, 1995). The German Commission E has approved the use of lavender flowers for addressing mood disturbances, such as restlessness or insomnia, functional abdominal complaints (nervous stomach irritations, intestinal gas), and nervous intestinal discomfort (Blumenthal *et al*., 1998).The Eclectics considered Lavandula angustifolia to be an agreeable and soothing lotion for treating headaches related to debility and fevers (Felter, 1994). The herb is an ingredient in soothing syrup prescribed for nervous irritability in children.

It is a natural antibiotic, antiseptic, anti-depressant and sedative. It is often used to treat scalds, minor burns, cuts, grazes, inflammation, eczema, dermatitis, headache, insomnia, acne dandruff, boils, rheumatism (Jager *et al*., 1992), arthiritis, leucorrhoea, dysmenorrohea and stratch marks. Lavandula angustifolia reduces anxiety, stress and tension and therefore used for calming, soothing and relaxation. Lavandula angustifolia essential oil has been shown to have antiseptic, antibiotic and antifungal activity (Lisbalchin *et al*., 1998; Hammer *et al*., 1999; Nelson, 1997; Horne, 2001).

16. Scutellaria baicalensis

Scutellaria baicalensis (common name: skullcap; family : Lamiaceae) has a particularly high content of compounds that serve as modifiers of inflammatory processes, e.g. against bacterial infections, and also has antiviral, antitumor, antioxidative and hepatoprotective properties (Gao *et al*., 1999; Chan *et al*., 2000; Bochorakova *et al*., 2003; Shen *et al*., 2003). The principal active compounds are found in its roots and short rhizomes. The high level of physiologicaland therapeutic activities of Scutellaria baicalensis root extracts is due to the presence of almost 70 flavonoids: chalkones, flavanones, flavones, flavanonols, flavonols, and anthocyanidines. Flavones (wogonin, baicalein, and baicalin) and their glycosides (mainly glucuronides) are the most abundant. The total content of flavonoids in the roots of wild-grown Scutellaria baicalensis varies from 15 to 20% of the dry weight (12–17% is baicalin, a flavone glucuronide, and 3–4%is wogonside), with glycosides predominating. It is used to treat a variety of nervous complaints, including “female weakness”,(Steven & Varro, 1999) insomnia, and epilepsy, including grand mal seizures.It is used in combination with wood betony for nervous headaches, with valerian, passion flower, and/or kava for anxiety, and with adaptogens (e.g., ginseng) for chronic stress (Low, 2000).

17. Rhodiola rosea

Rhodiola rosea (Golden Root, Roseroot, Aaron's Rod) is a plant in the Crassulaceae family that grows in cold regions of the world. Rhodiola rosea is effective for improving mood and alleviating depression. Rhodiola rosea is also rich in phenolic compounds, which are known to have strong antioxidant properties. The investigation of the phytochemistry of Rhodiola rosea root has six distinct groups of chemical compounds: Phenylpropanoids (rosavins), Phenylethanol derivatives (salidroside), Flavanoids, Monoterpenes, Triterpenes and Phenolic acids (Brown *et al*., 2002). Rhodiola rosea root contains three cinnamyl alcohol-vicianosides (also know as rosavins) – rosavin, rosin, and rosarin – that are specific to this species (Dubichev *et al*., 1991; Ganzera *et al*., 2001)

It improves physical and mental performance, and reduces fatigue (Darbinyan *et al*., 2000; Ha *et al*., 2002). Rhodiola rosea's effects are potentially mediated by changes in serotonin and dopamine levels due to monoamine oxidase inhibition and its influence on opioid peptides such as beta-endorphins (Gregory & Kelly, 2001). In mountain villages of Siberia, a bouquet of roots is given to couples prior to marriage to enhance fertility and assure the birth of healthy children (Saratikov & Krasnov, 1987). In Middle Asia, Rhodiola rosea tea is the most effective treatment for cold and flu during severe Asian winters. (Khaidaev & Menshikova, 1978). Rhodiola

rosea is used as an astringent and for the treatment of hernia, leucorrhoea (vaginal discharge), hysteria, and headache (Linnaeus, 1749; Linnaeus, 1748). Extracts of the Rhodiola rosea root is found to contain powerful adaptogens. It protects from mental and physical stress, toxins, and cold (Saratikov & Krasnov, 1987; Krylov, 1969). It has antifatigue, anti-stress, antihypoxic (protection against damaging effects of oxygen deprivation), anticancer, antioxidant, immune enhancing and sexual stimulating effects (Darbinyan *et al*., 2000; Saratikov, 1974; Spasov *et al*., 2000; Furmanowa *et al*., 1995). Anti-fatigue, anti-stress, and anti-depressant properties, increases the bioelectrical activity of the brain, reduces stress and depression, improves memory and brain energy (Saratikov, 1974). As a traditional herbal remedy, Rhodiola rosea has been used by Tibetans to clear heat in the lungs, eliminate poisonous substances from the body and to treat epidemic diseases, edema to the limbs, and traumatic injury and burns. Rhodiola rosea has been categorized as an "adaptogen" due to its observed ability to increase resistance to a variety of chemical, biological and physical stressors.

18. Hypericum perforatum

Hypericum perforatum, commonly known as St John's Wort (Family: Hypericaceae) is a herbaceaous perennial plant widely distributed in temperate regions of Europe, Asia, North Africa and USA. Constituents include volatile oils (0.05 to 0.3%, including α-pinene, and cineole), anthraquinones, carotenoids, cumarine, flavonoids (0.5- 1.0%, including hyperoside, quercetin, and rutin), naphthodianthrones (0.1-0.3% of which 80-90% are hypericin and pseudohypericin), carbolic acids, phloroglucins (up to 3% hyperforin), xanthones, and proanthocyanidins. It in a standard extrat has a significant antidepressant activity by inhibiting the enzyme monoamino oxidase (MAO) (Muldner & Zoller, 1984). The antidepressant activity is not only limited to hypericin and hyperforin, xanthones of the plant also have this property. This is based on their contributions to the antiviral properties of the plant as well as speculation (based on early in vitro data) that they also contribute to the plant's antidepressant actions. Traditionally, Hypericum perforatum has a number of different uses including applying it externally as a treatment for wounds and burns, or taken internally as an infusion or herbal tea to treat fevers and nervous conditions including depression (Tonbridge, 1999). The constituent hyperforin is the most likely candidate to be responsible for the antidepressant activity (Johne *et al*., 1999) and critical to the therapeutic effects of Hypericum perforatum (Stevinson & Ernst, 1999). It has a broad spectrum of activities like analgesic (Ozturk, 1997), antianxiety (Davidson & Connor, 2001), antialcoholic (Perumi *et al*., 2001), antispasmodic (Izzo *et al*., 1996), antioxidant (Tripathi *et al*.,1999), calcium channel blocker (Shan *et al*., 1998), gene expression induction (Moore *et al*., 2000), wound healing (Rao *et al*., 1991), smooth muscle relaxant (Melzer *et al*., 1991), sleep potentiation (Girzu *et al*., 1997), anti-inflammatory (Schempp *et al*., 2000) and antimicrobial (Rios *et al*., Barbagallo & Chisari, 1987).

CONCLUSION

Thus problems that bedevil people in this stress strewn materialistic age are anxiety, confusion and depression. The affected people need to be assured that every thing is alright and they will be taken care of and given special consideration so that they feel secure and comfortable. In other words, a compassionate control needs to be exercised on them to wean them away to normalcy. However, medication causing minimum physical and mental side effects must complement this approach. Plant based potions and formulations can be relied upon for a side effect free, long term usage after appropriate efficacy evaluation studies. If depression and other related maladies are left untreated, even as much as 25 percent could become fatally affected, mainly as victims of suicide. Besides, care must be taken to ascertain the underlying cause of depression as it could also be the fallout of an underlying physical illness and through a thorough health examination to diagnose and weed out the root cause. Depression can be treated with an imaginative remedial regimen that incorporates herbal based medicines, social support and psychological intervention.

After all, knowledge about the healing properties of plants and herbs has been age old and used by generations of people across the globe, while pharmacological antidepressants have only been around for a few decades. However, scientific credence is an essential prerequisite to prove the efficacy and safety of the plant based products before clearing their remedial usage in depressive tendencies.

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