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A review study on the anti depressant and anti oxidant activities of *pisidium guajava* and *allium sativum*

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Abstract

When stress affects the body it interferes with physiological functions of the body and other normal functions such as physical and emotional behaviors of the individual and this is associated with the cause of depression, anxiety mental disorders. Here comes the cause of irrational responses of the body system. The different forms of irrational response are the symptoms for depression. Severe depression with significant effect on day to day life is considered as disability. There are so many synthetic medicines that are used to treat depressions they are playing a prominent role in this civilized world with so many adverse effects, in the other hand natural/ herbal medicines are also playing a crucial role with minimum to zero side effects. One of the main causes of depression is oxidative stress, which is a type of imbalance between the production of reactive oxygen species and the anti-oxidant defensive system.

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Introduction

Depression is a life-threatening illness that affects a large number of people. Mood swings, hallucinations, suicidal thoughts, anxiety, and other depravative states of mind, as well as some psychological imbalances, are all caused by changes in chemical mediators in the brain, as well as some biological inheritant. Currently, 35% of the world's population suffers from depression. It is thought to be the leading cause of death, particularly among teenagers. Internal stresses, fluctuations in serum levels of cholesterol, triglycerides, sugar, and coagulation factors are

some of the internal causes linked to depression. Tricyclic antidepressants, lithium salts, serotonin inhibitors, and monoamine oxidase inhibitors are some of the synthetic drugs used to treat depression these days. However, they can cause sleeplessness, dry mouth, constipation, tachycardia, tremors, sedation, insomnia, serotonin syndrome, anxiety, diaphoresis, postural hypotension, blurred vision, Parkinson, and other side effects. The pioneering study of Otto Loewi and other scientists, namely, that chemical transmission is the primary way by which nerves interact with one another, was one of the most significant discoveries in neuroscience. Today, it is widely accepted that pre- and postsynaptic events are tightly regulated and serve as the foundation for central nervous system plasticity and learning (CNS). Chemical transmission necessitates several steps, including neurotransmitter synthesis, storage in secretory vesicles, and regulated release into the synaptic cleft between pre- and postsynaptic neurons, as well as the termination of neurotransmitter action and induction of final cellular responses via various

steps in the signal transduction cascade. The main pathogenesis of depression and anxiety is based on changes in mono amino oxidase enzymes impairment or secondary messenger productions, as well as neuro endocrinology abnormalities, such as excess cortisol and steroid alterations, changes in GABAergic and/or glutamatergic transmission, impaired endogenous opioid function, and abnormal circadian rhythms.

Fig 01: The oxidation process

ROS origin pathway

Biochemical transmission

The diagram below depicts a synapse for biochemical neurotransmission in the brain. Biochemical transmission is the most important thing to accomplish for the transfer of biological messages from one nerve ending to the next throughout the body. The first step of synthesis is to regulate the transport of amino acids from the blood to the brain, where precursors are converted into transmitters via an enzymatic reaction, which are then stored in the synaptic cleft and released into the synaptic cleft via a Ca^{2+} -dependent process [1]. The rate of nerve firing is determined by the amount of biochemical released into the synaptic cleft, and some of the drugs that modify this process include. The synaptic effects are terminated by binding of specific transmitters to specific transporter proteins, which are remetaoiled by enzymes and stored in their respective vesicles, and the synaptic effects are terminated by binding of specific transmitters to specific transporter proteins, which are remetaoiled by enzymes and stored in their respective vesicles [2]. The biochemical substances do not pass the postsynaptic membrane, but they do govern the cascade of processes through initial binds to post synaptic surface receptors, which are frequently connected to G-protein

coupled receptors. These receptors are important regulators in transmembrane signalling because they modulate a number of effector systems networks within the cell, such as adenylyl cyclase, phospholipase, and phosphoinositol mediate systems, the initial cellular events of signal transduction cascade, through phosphorylation of protein kinase, which leads to biological responses and resists oxidative stress. And this entire process that leads to the potentiation of synaptic endings and neuronal survival, on the other hand, the disruption of several steps of biochemical transmission that causes depression, according to the most recent inventions, these disruption mechanisms are the targets of anti-depressant actions.

Fig 02: A synapse and the steps of chemical transfer are depicted schematically.

Precursors are carried from the bloodstream into the brain (A), where they are transformed into transmitters and stored in synaptic vesicles via enzymatic activities (B). The transmitters are released into the synaptic cleft (C), where they interact with presynaptic auto receptors to control synthesis and release, or with postsynaptic receptors to trigger downstream signal transduction activities (D). MAO stands for monoamine oxidase. Medicinal herbs have a long history of use in the treatment of a variety of disorders; nevertheless, they have a greater role in the therapy of depression, which is why more research is being done. The psychopharmacological actions of medicinal herbs against the nervous system are similar to those of antidepressants, in that they help regulate serotonin, dopamine, and noradrenaline reuptake, as well as MAO inhibition and modulation of the neuroendocrine system and the hypothalamic-pituitary-adrenal (HPA) axis. Because of the numerous unpleasant events induced by synthetic drugs, medicinal plants are attracting the attention of researchers in the treatment of depression. There are numerous herbal plants that have been shown to have anti-depressant activity, but some study is still ongoing.

Medicinal Plants as Anti Depressants

Psidium Guajava

Family: Myrtaceae

The evergreen shrub or small tree *Psidium guajava*, the common guava, yellow guava, or lemon guava, is endemic to the Caribbean, Central America, and South America. It is easily pollinated by insects; when farmed, it is mostly pollinated by *Apis mellifera*, the common honey bee. Guava is high in anti-oxidants, vitamins, and minerals, including vitamin C, as well as calcium, potassium, sulphur, sodium, iron, boron, magnesium, manganese, and vitamin C & vitamin B.

Fig 03: *Psidium guajava* shrub

The higher concentrations of Mg, Na, S, Mn, and B in GLs make them an excellent choice for human nutrition as well as animal feed to prevent micronutrient deficiency. Guava is grown in the southern and northern parts of India. There are many varieties of guava available, each with its own importance and significance. Alkaloids + Saponins, Tannins, Steroids, Anthocyanins, Flavonoids, Anthraquinones, Phenolic flavonoids, Ascorbic acid, Cardiac glycosides, Triterpenoids, Phlobatannins Guava's anti-inflammatory, anti-anxiety, anti-diarrheal, anti-convulsant, anti-oxidant, anti-depression, and other known properties are due to the presence of these phytochemicals. Fever, diarrhea, and psychiatric tonics are all treated using infusions of the leaves. The essential oil of *P. guajava* leaves is high in cineol, tannins, and triterpenes. Three flavonoids have also been extracted from the leaves. Guava leaf methanolic extract contains anti-inflammatory and analgesic properties [3,4]. Leaf extract has also been utilized as a diabetic mellitus treatment. Plant items are used to treat minor disorders at home [5,6]. If more study is done in this area, it could be used to treat a variety of ailments [7].

Allium sativum

Family: Amaryllidaceae

It is usually referred to as garlic or Chinese garlic, and it has a wide range of therapeutic applications. It has a long history of lowering triglyceride levels, and it was used for a variety of purposes in ancient times.

Fig 04: *Allium sativum* shrub

As a result, many studies are being conducted to prove its actions. Alkaloids and flavonoids are two different types of alkaloids [8-12]. Glycosides Sugar-reduction Saponin Steroids are a type of steroid that occurs naturally in the Phenols Terpenoid, Anthraquinones Tannin, as well as minerals including potassium, calcium, magnesium, zinc, phosphorus, iron, copper, and garlic, are farmed all year in India, primarily in the north. Garlic is high in minerals including vitamins B6 and C, as well as the dietary minerals manganese and phosphorus. It's also a good source of B vitamins like thiamin and pantothenic acid, as well as the minerals calcium, iron, and zinc. Raw garlic is composed of 59 percent water, 33 percent carbs, 6 percent protein, 2 percent dietary fiber, and less than 1% fat.

Conclusion

Our hypothesis is to treat depression with a polyherbal formulation because the selected herbs are high in vitamin C and can destroy free radicals in the body, inhibiting further oxidation and conversions. The main cause of depression is a decrease in monoamines, and another theory claims that an increase in serotonin levels causes depression.

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