



A Review On Miraculous Herb For The Treatment Of Depression: *Passiflora Incarnata*

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Abstract

Background: *Passiflora incarnata* (PI) is a common herbal sedative and anti-anxiety drug used to treat various types of depression as well as having other therapeutic effects. It's also mentioned in several pharmacopoeias.

Objective: The purpose of this study was to look into the antidepressant effects of PI extract in the forced swim test (FST) and tail suspension test (TST) in male mice.

Methods: various clinical and preclinical studies are performed in studies based on animal models for the treatment of depression.

Conclusion: *passiflora incarnata* having antidepressant effect in an animal depression model and various dosage forms are prepared from extract of *passiflora incarnata*. Flavonoids and alkaloids having more antidepressant properties as compared to others.

Keywords- Depression, *passiflora incarnata*, Methods, Etiology, Chemical constituents, Dosage forms, Therapeutic properties.

1. INTRODUCTION

Depression is a serious disorder with a substantial impact on public in terms of prevalence, unhappiness, dysfunction, morbidity, and financial cost, health is the most important factor. Depression affects women more commonly than men. Unipolar depressive episodes had a point of incidence of 1.9% for men and 3.2% for women, with a one-year Men had a prevalence of 5.8%, while women had a prevalence of 9.5%. Ischemic heart disease is the leading cause of disability-adjusted life years (DALYs) is predicted to be depression by 2020, accounting for 5.7% of all disease burdens assuming demographic and epidemiological trends continue [1]. According to WHO projections, one in five women and twelve men experience depression globally nowadays [2-3]. Depression is classified as follows by the American Psychiatric Association. A disorder of disruptive mood dysregulation, a major depression, a chronic depressed sickness (dysthymia), or depression caused by another medical concern. One of the primary physiological causes of depression is a decrease in neurotransmitter levels such as serotonin, dopamine (DA), and noradrenaline (NA) [4-5]. Depression symptoms include a melancholy mood, feelings of shame, loss of interest or pleasure or poor self-worth insomnia, anorexia, and fatigue, and trouble focusing. According to the World Health Organization, by 2020, depression will have surpassed anxiety as the second-leading cause of disease impairment. (WHO) [6-7].

1.1 Methodology

Animal models used in depression like forced swim test and tail suspension test. [8-9].

1.2 Depression types

There are several types of depression other than major depression, each defined by its symptoms or underlying causes-

1. A milder form of depression known as dysthymia, or chronic depressive disorder, is continue for a minimum of two years
2. Postpartum depression appears after a woman has given birth as severe grief, exhaustion, and worry.
3. PMDD (premenstrual dysphoric disorder) produces significant sadness, fury, and anxiety [10]. There has been a case of mixed depression associated to bipolar 1 and bipolar 2 and major depressive disorder [11-14].

1.3 Etiology

The complicated etiology of depression, which involves both genetic and environmental factors, has been linked to a number of biological risk factors. Alzheimer's and Parkinson's disease, stroke, multiple sclerosis, epilepsy, cancer, macular degeneration, and chronic pain have all been related to an increased risk of depression. [15-16]

2. *Passiflora incarnata*

The *Passiflora incarnata* also known as passion fruit is belonging to Passifloraceae family and is utilized in conventional medicine to treat neuralgia, jitters, and anxiety [17]. South America Australia, South East Asia, and other regions are

now developed as sources of pharmaceutical raw materials [18]. There are 500 species of Passiflora genus, originating from the Latin word "Passio," which Spanish explorers first came across in 1529 used as a symbol for the "Christ's passion." [19]. It is included in several pharmacopoeia, British Herbal Pharmacopoeia, American Homoeopathic Pharmacopoeia, Indian Homoeopathic, Pharmacopoeia Helvetica, Egyptian, French, German and Swiss pharmacopoeia and the British Herbal Compendium are all examples of pharmacopoeias. [20-22]. Clinical trials revealed no serious complications, Ministry of Food and Drug Safety of Korea lists the possibility of using it as a food ingredient [23-24]. Passiflora flavonoids and alkaloids having anxiolytic qualities in phytochemical investigations [25–26]. For instance, *P. incarnata* has larger levels of isovitexin than other species [27- 28]. The On March 25, The European Medicines Agency published a herbal monograph on *Passiflora incarnata* in 2014 recognising its therapeutic usefulness [29]. Clinical studies found no dangers to human health from using *Passiflora incarnata*. Main chemical constituents are mentioned below in **figure 1** [30-31].

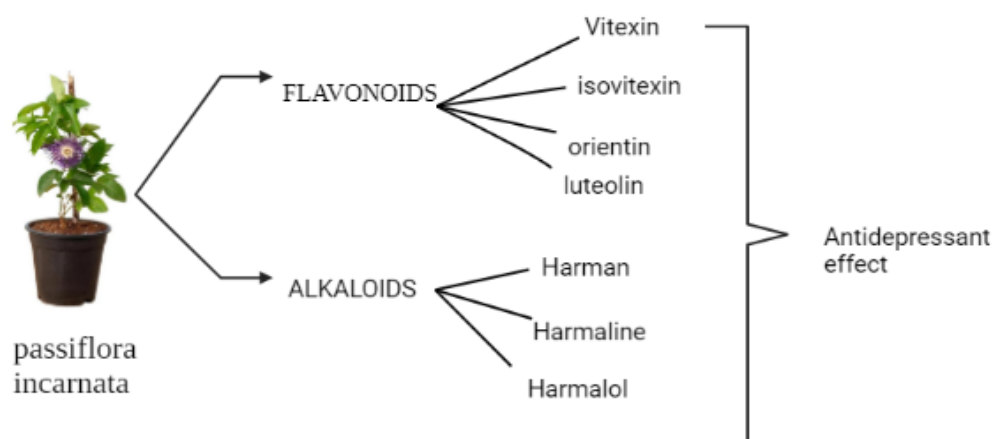


Figure 1 - Main chemical constituents used for depression.

2.1 Flavonoids

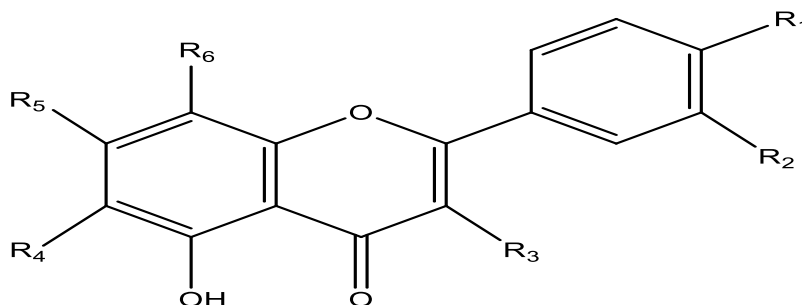


Figure 2- Flavonoids' chemical structures

Table 1. Flavonoids that includes vitexin, isovitexin, orientin, isoorientin, chrysin, luteolin is mentioned in table 1 shows the Flavonoids of *Passiflora incarnata* [32-44].

Flavonoids	R1	R2	R3	R4	R5	R6	References
Vitexin	OH	H	H	H	OH	Glucose	32
Isovitexin	OH	H	H	Glucose	OH	H	33
Orientin	OH	OH	H	H	OH	Glucose	34
Luteolin	OH	OH	H	H	OH	H	32
Chrysin	H	H	H	H	OH	H	34

Passiflora flavonoids and alkaloids have reportedly been linked to its anxiolytic qualities in phytochemical investigations [35–36]. And numerous techniques can be used to raise the level of these metabolites in the leaves For instance; *P. incarnata* has larger concentrations of isovitexin [37-38]. Based on research demonstrating that *Passiflora* extracts contain flavonoids, which have a variety of pharmacological properties . Some of flavonoids categories are mentioned below in **figure 3** [39-41].

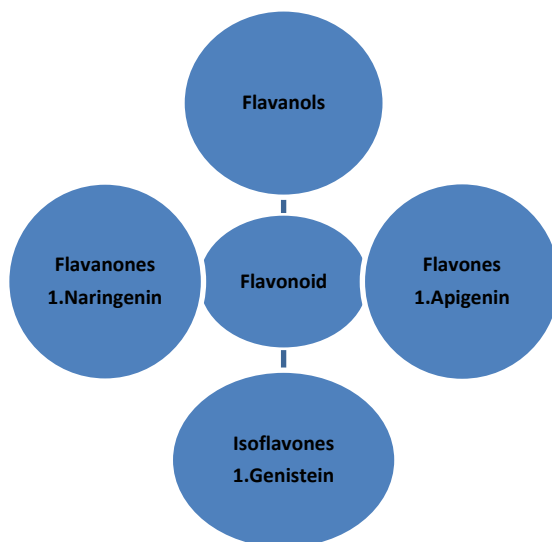


Figure 3 categories of flavonoids

Table 2-Flavonoids have pharmacological operates on the central nervous system to affect emotional and mood states as a result of morphological and neurochemical changes just like other antidepressants shows the neurobiological effects of various flavonoids.in Table 2 [42-45].

Depression model	Flavonoids	Doses	Treatment time	Effect	References
Forced swim test	Luteolin	50 mg/kg (by mouth)	30 minutes before the test	Antidepressant	42
	Vitexin	10 to 30 mg/kg (by mouth)	60 minutes before the test	Antidepressant	43
	Chrysin	5 to 20 mg/kg (by mouth)	28 days	Antidepressant	44
Suspension test	Vitexin	10 to 30 mg/kg (by mouth)	60 minutes before the test	Antidepressant	43
	Orientin	20-40 mg/kg (by mouth)	21 days	Antidepressant	44
	Kaempferol	30mg/kg (by mouth)	14 days	Antidepressant	45

2.2Alkaloids

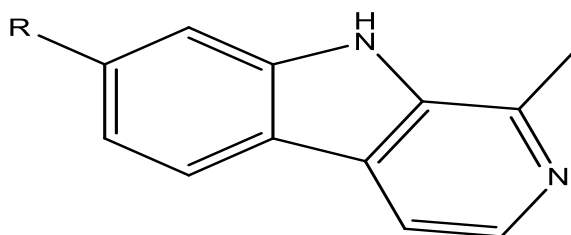


Figure 4 -chemical structure of alkaloids

The second-largest known group of alkaloids is indole type (beta- carbolines) mentioned in **figure 4**, found in *Passiflora incarnata* and useful for treat hypertension and act as sedative in medicines [46-47]. Harman, harmine, harmol, harmaline, and harmalol were identified in experiments conducted in the 1960s. [48-49].

Table 3 -Primary alkaloids of *Passiflora incarnata* [50].

Alkaloids	R
Harmaline	OCH3
Harmol	OH
Harman	H

In reality, the majority of currently available antidepressants inhibit one or more of the following pathways: a) monoamine reuptake inhibition; b) inhibitory presynaptic monoamine receptor inhibition; and c) inhibition of monoamine oxidases (MAO), enzymes found in synaptic clefts that are responsible for monoamine breakdown. In clinical investigations, all of these molecular pathways result in enhanced monoamine neurotransmission this alleviates typical depression symptoms. [51-53].

Table 4. Numerous plant alkaloids have been reported to have antidepressant properties .List of extracted alkaloids from plants with antidepressant properties [54-57].

Serial number	Plant name	Mechanism of action	References
1	Berberis aristata	Serotonergic, nonadrenergic and dopaminergic interventions MOA(monoamine oxidase) inhibition	54
2	psychotria myiantha	MOA(monoamine oxidase inhibition)	55
3	Peganum harmala	Serotonin receptor 2A is one of the receptors that interfere with MOA-A and severe cell surface receptors.	56
4	Sceletium tortuosum	5-HT reuptake inhibition	57

3. Dosage forms of passiflora incarnata

There are four registered research projects which are shown in Table 5, all of which focus on the species PI. The National Institutes of Health has approved Passiflora is used to treat anxiety in a number of clinical studies [58].

Trial number	Dosage form	Formulation	Stages	Periods
NCT00794456	Tablet	Salix alba P.incarnata (Cretaceous oxyacantha)	3 rd Phase	6 weeks
NCT01178632	Tablet	Salix alba L., Crataegus oxyacanthus L., and Passiflorine, P. incarnata L.	3 rd Phase	4 weeks
NCT00944268	Liquid	P.incarnata L. oxyacanthus Albican, Salix, L.	3 rd Phase	30 days
NCT02065843	Capsules	100 mg of P. incarnata L.	2 nd ,3 rd Phase	Before dental surgery, an hour

4. The therapeutic qualities of Passiflora incarnata

4.1 Central nervous system sedative effect -Animals receiving a dosage of 60–250 mg/kg body wt. of an extract made from 30% or 40% ethanol stop moving around [58-59].The dose of 40% ethanol extract increased by 60 mg/kg body wt. sleep duration whereas 50 mg/kg body weight dose delayed the onset of seizures. [68]. Animal mice were given a herbal Passiflorae water extract at a dose of 160-250 mg/kg body wt., which reduced convulsions, increased sleeping duration, and decreased motor movement [60].

4.2 Insomnia- For seven days, 41 participants (18-35) kept a sleep diary and drank tea brewed with Passiflora incarnata L. On the last night, 10 of these people performed overnight polysomnography [61]. This research suggests that Passiflora incarnata L. may have an impact on sleep quality [62].

4.3 Anti-inflammatory effect- Animals receiving an intragastric injection of herba Passiflorae ethanol extract, 75-500 mg/kg experience a reduction in inflammation one hour after ingestion herba Passiflorae possesses anti-inflammatory and antioxidant characteristics that help it prevent and treat a number of ailments, including severe inflammatory disorders. [63-64].

4.4 Analgesic effect- It has sedative, anti-inflammatory, anti-asthmatic, antitussive, and anxiolytic properties. The plant has an effective safety plan .Passiflora incarnata has an impact on addicts' emotions, behavior, and other issues while reducing withdrawal symptoms [65-66].

5. Lists of products and formulations that have been registered on Data visa ANVISA, including Passiflora species in combination with additional active ingredients mentioned in table 6 [67-70].

Dosage form	Manufacture code	Status	Active	References
Oral	09.545.589/0001	Valid	PI Linnaeus	67
Coated tablet	92.265.552/0001-40	Cancelled	Salix alba L./ PI Linnaeus (leaves extract)	68
Oral solution	57.507.378/0003-65	Valid	Passiflora alata Curtis/ sodium salicylate (fluid extract)	69
Simple dragee /oral solution	45.992. 062/0001-65	Cancelled	sodium salicylate/Agoniada dry extract/Passiflora extract	70

Conclusion

Depression is the most common psychiatric disorder condition in the population reported in many of the studies. This review is based on Preclinical and clinical study of phytochemicals of passiflora species like flavonoids and alkaloids for antidepressant effect and neurochemical action in the brain Alkaloids and flavonoids having great potential on depression according to the clinical and preclinical studies. Passiflora species is commonly found worldwide for the treatment of anxiety, insomnia, cough, sexual dysfunction, and other conditions most used for depression. Various types of preparation like extracts is derived from this species and produced therapeutic response and having less side effects as compared to synthetic medications and low cost.

Conflicts of interest

The author has declared no interest of conflicts.

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Abbreviations used

PI	(Passiflora incarnata)
MOA	(monoamine oxidase)
5HT	(5-hydroxytryptamine)
WHO	(world health organization)
NA	(nor-adrenaline)
Incarnata L.	(Incarnata Linnaeus).

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