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CRITICAL REVIEW OF DIFFERENT AYURVEDIC DRUGS W.S.R. TO VISHAD (DEPRESSION)

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ABSTRACT

In todays globalized era depression is estimated to affect 300million people. The world mental health survey conducted in 17 countries found that on average about 1 in 20 people reported having an episode of depression in the previous year. Depression is a common mental disorder that presents with depressed mood, loss of interest or pleasure, decreased energy, feelings of guilt or low self-worth, disturbed sleep or appetite, and poor concentration. Depression in *Ayurveda* can be compared with *Vishad*. Vishad is one of the *Vatananatmaja Vikaras*. The symptoms of *Vishad* which are found in various references in Indian science when compared to depression almost appear similar, so we can correlate *Vishad* with depression. There are some common side effects of modern anti-depressant drugs such as nausea, loss of sexual desire, fatigue and drowsiness, insomnia, blurred vision, dizziness, irritability etc. Our *Ayurvedic* texts has given various drugs for treatment of Vishad. Current study focuses to gather different *Vishadhar* drugs from different *ayurvedic* literatures and various research papers. A list of ayurvedic drugs having anti-depressant and related beneficial effects in treatment of depression is compiled.

KEYWORDS: Vishad, Depression, Ayurvedic drugs, *Vishadhar*.

INTRODUCTION

Today depression is estimated to affect 300million people. The world mental health survey conducted in 17 countries found that on average about 1 in 20 people reported having an episode of depression in the previous year.[1] At its worst depression can lead to suicide.

Close to 800000 people die due to suicide every year. Suicide is the second leading cause of death in 15-29 year olds. The slogan for year 2017 was 'Depression let's talk'.[2]

Depression is a common mental disorder that presents with depressed mood, loss of interest or pleasure, decreased energy, feelings of guilt or low self-worth, disturbed sleep or appetite, and poor concentration.

Depression in *Ayurveda* can be compared with *Vishada*. *Vishada* is one of the *Vatananatmaja Vikaras* and it is further said that *Vishada* is the main factor that increases the range of all the diseases "*Vishado Rogavardhanaanaam Shreshthah". Dalhana commented "Asiddhi Bhayat Vividheshu Karyasu Sado Apravrutihi*" i.e a condition originated from apprehension of failure, resulting in incapability of mind and body to function properly with significant reduction in activity. Symptomatic representation of the state of *Vishada* is explained in Shrimad Bhagvad Geeta. The symptoms of *Vishada* which are found in various references in Indian science when compared to depression almost appear similar, so we can correlate *Vishada* with depression.[3]

A man is healthy only when his body and mind is healthy. The science of Ayurveda brings out his idea by conveying the concept of *swastha*(healthy individual), where *prasanaatmeindriyamana* (pleasant mental faculty) is mentioned as one among the indicators of a healthy individual. *Shareer*(body), *indriya*(senses), *satva*(mental faculty), *atma*(soul) constitute life.

There are some common side effects of modern medicines of depression such as increased sweating, increased blood pressure, heart palpitation, fast heart rate, dry mouth, digestive problem, changes in appetite etc. Some of *ayurvedic* drugs which acts on *mana* shows very good result to treat depression.

Ayurvedic concept of depression

Our mind controls our body. The mind is responsible for perception, thinking, understanding, and taking the right decision at the right time.[4] If the mind is sick then the body mind apparatus is in danger. When the mind is in status of health, it contains positive feelings like love, affection, sharing and caring. Due to improper diet and action the natural state of mind is disturbed and these positive feelings are driven out. Then they give place to negative

feelings sad, anxious, empty, hopeless, worried, helpless, worthless, guilty, irritable, hurt or restless.[5]

Table No. 1: Doshic predominance of symptoms.

Symptoms of depression[6]	***Dosha***
Sadness of mood	*Vata*
Lack of pleasure	*Kapha*
Sleep disturbances	*Vata*
Appetite changes	*Vata*
Easy fatigability	*Vata*
Psychomotor retardation	*Kapha*
Guilty feeling	*Vata*
Poor concentration	*Vata*
Suicidal ideation	*Vata*

Clinical symptoms and correlation

Depression can be correlated as *avasada, vishada, manodhukhaja unmada and kaphaja unmada* according to the etiology and symptoms exhibited by the disease. *Vishada* and *avasada* are the terms used synonymously.[7] *Vishada* is classified under *manasika bhava* as well as *manasika vikara* in *Ayurveda.*[8] It is particulary caused by vata *dosha*.[9] *Vishada* is caused by apprehension and result in despondency and inertia.[10] It is the prime factor for aggravation of all illnesses. So the psychoneuro immunological aspect of depression can be established here. The stress hormone, cortisol which is found elevated in depressed is known in suppressing the functions of immune system. One of the psychodynamic factors in causation of depression is loss of object. The hate and anger of the lost object is directed to self.[11] Similar condition is explained as *manodhukhaja unmada*. The symptoms expressed are grief, complaining or praising the lost, pallor and fainting, weeping, tearfulness, emotional withdrawal.[12] *Kaphaja unmada* on the other hand is characterized by *sthanam eka dehse* (staying in one place-catatonic features), *thushni bhava* (observing silence), *achankramana* (reduced or absence of activities), *lalasinghanaka srava, sauchadwesha* (discharge of saliva and nasal secretion- lack of self-care), anannabhilasha (disinclination for food), *rahaskamatha* (prefer to stay alone), *bhibhatsyathwam* (disgust feeling).[13] These features are seen in patients with major depressive disorders. So in severe conditions, the disease can be correlated with *kaphajonmada.*

Table No. 2: Ayurvedic principles of treatment for depression.

Parameter	Treatment principle
Sharririk dosha	*Vatanuloman, Vatahara*
Mansik dosha	*Tamodoshahara*
Jannendriya	*Inriya prasadak*
Agni	*Agni deepana, sadhakagni balanced for proper emotions*
Dhatu	*Correction of agni and metabolism*
Ojus	*Rasayan, medhya*
Satwa	*Satwavajaya*

Different ayurvedic drugs for depression

1. *Ashwagandha* (*Withania somnifera*)

बल्यारसायनी तिक्ता कषायोष्णातिशुक्रला I (भा. प्र.गुडुच्यादिवर्गः १९०)[14]

a) Evaluation of antidepressant activity of Aques extract of *Withania somnifera* (Ashwagandha) root in albino mice.[15]

Dr.P.Bharathi1, Dr. V.Seshayamma2, Dr. G. Hari Jagannadharao3, Dr.N.Sivakumar4 1

The antidepressant activities of aqueous extract *Withania somnifera* roots (AEWS) were studied using - Forced swim test (FST). Effect of different doses of AEWS (30,40,50 mg/kg), Imipramine (15mg/kg)were studied on behavioral despair tests induced immobility time. WS produced dose dependent decrease in immobility time in FST, maximum effect being observed with WS 50 mg/kg. The findings support the use of WS as potential adjuvant in depressive disorders.

b) Anti-depressant effects of *Withania somnifera* fat (Ashwagandha ghrutha) extract in experimental mice.[16]

Jayanthimk, Prathima c1, HuralikuppiJC1, Suresharn and Muralidhar

The anti-depressant activity of *Withania somnifera* (AGG) was studied using 3 models, Behavioral despair tests-Forced swim test (FST), Tail suspension test (TST) and Anti-reserpine test. Effect of different doses of AGG (20, 40mg/kg), Imipramine (15mg/kg) and their combination (10mg/kg each) were studied on behavioral despair tests induced immobility time and reserpine antagonism. WS produced dose dependent decrease in immobility time in chronic studies in FST and TST model, maximum effect being observed with WS 40 mg/kg. On anti-reserpine models, ptosis, catatonia and sedation scores in the standard, test and combination drug groups were significantly different from the control group. The findings support the use of WS as potential adjuvant in depressive disorders.

c) Effect of *Withania somnifera* on forced swimming test induced immobility in mice and its interaction with various drugs.[17]

P. C. Shah, N. A. Trivedi, j. D. Bhatt and k. G. Hemavathi

The objective of the study was to evaluate the antidepressant action of Withania somnifera (WS) as well as its interaction with the conventional antidepressant drugs and to delineate the possible mechanism of its antidepressant action using forced swimming model in mice. Effect of different doses of WS, fluoxetine and imipramine were studied on forced swimming test induced mean immobility time (MIT). Moreover effect of WS 100 mg/kg, i.p. was observed at different time intervals. Effect produced by combination of sub therapeutic doses of WS with imipramine (2.5 mg/kg, i.p.) as well as fluoxetine (2.5 mg/kg, i.p.) were also observed. Effect of WS (100 mg/kg, i.p.) as well as combination of WS (37.5 mg/kg, i.p.) with either imipramine (2.5 mg/kg, i.p.) or fluoxetine (2.5 mg/kg, i.p.) were observed in mice pretreated with reserpine (2 mg/kg, i.p.) and clonidine (0.15 mg/kg, i.p.). Effects of prazosin (3 mg/kg, i.p.) or haloperidol (0.1 mg/kg, i.p.) pre-treatment were also observed on WS induced decrease in MIT. WS produced dose dependent decrease in MIT. Maximum effect in MIT was observed after 30 min of treatment with WS 100 mg/kg, i.p. Combination of WS (37.5 mg/kg, i.p.) with imipramine (2.5 mg/kg, i.p.) or fluoxetine (2.5 mg/kg, i.p.) also produced significant decrease in the MIT. Clonidine and reserpine induced increase in MIT, was significantly reversed by treatment with WS (100 mg/kg, i.p.) as well as combination of WS (37.5 mg/kg, i.p.) with either imipramine (2.5 mg/kg, i.p.) or fluoxetine (2.5 mg/kg, i.p.). Pre-treatment with prazosin but not haloperidol, significantly antagonized the WS (100 mg/kg, i.p.) induced decrease in MIT. It is concluded that, WS produced significant decrease in MIT in mice which could be mediated partly through a adrenoceptor as well as alteration in the level of central biogenic amines.

2. *Vacha* (*Acorus calamus*)

- वचाअतिगुणाड्यामतिमेधायुः समृध्दिदा कफनुत I

वृष्या च वातभूतकृमिदोषघ्नी च बल्या II (रा. नि. पिप्पलादिवर्गः ५४)[18]

- वचोग्रगन्धाकटुकातिक्तोष्णावान्तिवन्हिकृत् I

विबन्धाऽऽध्मानशूलघ्नी शकृन्मुत्रविशोधिनी II

अपस्मारकफोन्मादभूयजन्त्वनिलान् हरेत् II (भा. प्र. हरीतक्यादिवर्गः१०३)[19]

a) Evaluation of antidepressant activity of aqueous extract of roots of *acorus calamus* in albino mice.[20]

Dr. Shashikala GH, Dr. Prashanth D, Dr. Jyothi CH3, Dr. Imran Maniyar, Dr. Manjunath H.

A total of 72 albino mice were included in the study. Six groups of six animals in each group were taken in each of the behavior despair models [forced swimming model (FSM) and tail suspension model (TSM)]. Three groups of mice received aqueous extract of Acorus calamus (at doses 100, 150, 200 mg/ kg body weight), two groups received standard drugs (imipramine 15 mg/kg and fluoxetine 10 mg/kg) and control group received normal saline. Antidepressant activity (i.e., Immobility time) was assessed after 30 minutes of administration of drugs intraperitoneally. Data was analyzed by ANOVA statistical test (with p followed by Tukey's Post Hoc Analysis. Results expressed as Mean ± SEM. Conclusion: The aqueous extract of roots of Acorus calamus has shown antidepressant activity when tested in FSM & TSM.

b) Antidepressant-like effects of *Acorus calamus* in forced swimming and tail suspension test in mice.[21]

Pawar Vinod S, Anup Akhade, Shrikrishna Baokar, Shivakumar H.

Tail suspension test (TST) and forced swimming test (FST) in mice were used to evaluate the antidepressant activity of methanolic extract of rhizomes of *A. calamus*. Methanolic extracts (50 and 100 mg/kg i.p.) were administered daily for 7 days. Imipramine 5 mg/kg was used as standard antidepressant agent throughout the study. Conclusion: Methanolic extract of *A. calamus* rhizomes shows antidepressant activity probably through interaction with adrenergic, dopaminergic serotonergic and γ-aminobutyric acid (GABA) nergic system. Both the models have been proved to be equally valuable for demonstration of substances with a potential antidepressant activity.

c) Effect of rhizome extract of *Acorus calamus* on depressive condition induced by forced swimming in mice.[22]

Ilaiyaraja N, Dongzagin Singsit, and Farhath Khanum

The study evaluated the anti-depressant properties of *A. calamus* rhizome in a forced swimming test (FST) of mice model. Three doses of methanol extract of rhizome (200,400 and 600 mg extract/kg b.wt) and imipramine (15 mg/kg b.wt), a positive control, were orally administered once a day for the consecutive period of 14 days in Balb/c mice. The effect of

extract on immobility period was measured using forced swimming test. The levels of cortisol monoamine oxidase and neurotransmitters were analyzed using standard methods. The anti-depressant effect was observed maximum at the dose of 200 mg/kg. b.wt that caused 23.82% reduction in immobility period. The extract also significantly attenuated the FST-induced elevation of plasma cortisol, monoamine oxidase activity and returned the altered levels of neurotransmitters near to the normal levels in brain. These results of the present study suggest that the extract of *A. calamus* rhizome has antidepressant-like activity which is mediated by modulating the central neurochemical as well as HPA (hypothalamic-pituitary-adrenal) axis in response to stress induced by FST. Therefore, *A.calamus* rhizome may be used as a valuable herbal supplement for the treatment of depression related conditions.

3. *Khurasani ova* (*Hyoscyamus niger*)

- खुरासनीयवानीतुयवानीसदृशीगुणैः I

विशेषात पाचनी रुक्षा ग्राहिणी मादिनी गुरुः II (भा. प्र.हरीतक्यादिवर्गः ८०)[23]

Antidepressant like Property of *Hyoscyamus niger* Linn. in Mouse Model of Depression.[24]

Amit D. Patil, Atul Y. Patil and Amol A. Raje

Antidepressant activity was studied in forced swim test (FST) and tail suspension test (TST) in mice. Locomotor and anxiolytic activity was also studied. *Hyoscyamus niger* ethanolic extract was administered to mice by oral route at dose of 25, 50, 100, 200 and 400 mg/kg for 14 days. Further an interaction of *Hyoscyamus niger* ethanolic extract with conventional antidepressant drugs were also studied at sub-effective doses. Results: The ethanolic extract (50, 100, 200 and 400 mg/kg) significantly reduced immobility duration of mice in FST and TST. The same doses did not change the motor activity in mice. However, high dose of extract has shown anxiolytic activity. Interaction study with conventional antidepressant drugs reduced the duration of immobility count suggests, possible involvement of biogenic amine in antidepressant action. Conclusion: These data suggests that *Hyoscyamus niger* possesses antidepressant like action in mouse model of depression.

4. *Tagar* (*Valeriana wallichi*)

- तगरव्दयमुष्णंस्यातस्वादुस्निग्धंलघुस्मृतम I

विषापस्मारमूर्धाक्षिरोग्दोषत्रयापहम II (भा. प्रकर्पूरादिवर्गः २९)[25]

- तगरंशीतलंतिक्तंद्यष्टिदोषविनाशनम् I

विषार्त्तिशमनं पथ्यं भूतोन्माद भयापहम् II(रा. नि. करवीरादिवर्गः १४३)[26]

a) *Valeriana wallichii* root extract improves sleep quality and modulates brain monoamine level in rat.[27]

Surajit Sahu, Koushik Ray, M.S. Yogendra Kumar, Shilpa Gupta Hina Kauser, Sanjeev Kumar, Kshipra Mishra, Usha Panjwani

The study was performed to investigate the effects of Valeriana wallichi (VW) aqueous root extract on sleep-wake profile and level of brain monoamines on Sprague-Dawley rats. Electrodes and transmitters were implanted to record EEG and EMG in freely moving condition and the changes were recorded telemetrically after oral administration of VW in the doses of 100, 200 and 300 mg/kg body weight. Sleep latency was decreased and duration of non-rapid eye movement (NREM) sleep was increased in a dose dependent manner. A significant decrease of sleep latency and duration of wakefulness were observed with VW at doses of 200 and 300 mg/kg. Duration of NREM sleep as well as duration of total sleep was increased significantly after treatment with VW at the doses of 200 and 300 mg/kg. VW also increased EEG slow wave activity during NREM sleep at the doses of 200 and 300 mg/kg. Level of norepinephrine (NE), dopamine (DA), dihydroxyphenylacetic acid (DOPAC), serotonin (5-HT) and hydroxy indole acetic acid (HIAA) were measured in frontal cortex and brain stem after VW treatment at the dose of 200mg/kg. NE and 5HT level were decreased significantly in both frontal cortex and brain stem. DA and HIAA level significantly decreased only in cortex. DOPAC level was not changed in any brain region studied. In conclusion it can be said that VW water extract has a sleep quality improving effect which may be dependent upon levels of monoamines in cortex and brainstem.

b) Antidepressant effect of *Valeriana wallichii* patchouli alcohol chemotype in mice: Behavioural and biochemical evidence.[28]

Sangeeta Pilkhwalsah, Chandra S. Mathela

Antidepressant effect of dichloromethane extract of *Valeriana wallichii* (10, 20 and 40mg/kg, p.o.) using forced swim test, was determined in both acute and chronic study. The neurotransmitter levels were estimated in mouse forebrain after two weeks of dosing. RESULTS: Single administration of extract (40mg/kg) significantly inhibited the immobility period in mice ($p<0.05$). Similarly, chronic administration of extract (20 and 40mg/kg) significantly reduced the immobility period and significantly increased the levels of

norepinephrine and dopamine in mouse forebrain ($p<0.05$). CONCLUSIONS: The extract demonstrated antidepressant effect and significantly increased the norepinephrine and dopamine levels in forebrain.

c) Terpenoid Content of *Valeriana wallichii* Extracts and Antidepressant-like Response Profiles.[29]

FazalSubhan, Nasiara Karim, Anwarul Hassan Gilani and Robert D. E. Sewell

Three extracts of *Valeriana wallichii DC* (Valerianaceae) rhizome and fluoxetine were studied for antidepressant-like activity in two behavioral models, namely the forced swim test (FST) and the tail suspension test (TST). Fluoxetine as well as methanolic and aqueous extracts of V. wallichii induced monophasic dose-related decrements in immobility times in both tests. However, the aqueous-ethanolic fraction induced a biphasic dose-response profile since it produced a graded effect up to 200 mg/kg but the highest dose (250 mg/kg) was inactive in the FST. This extract also exhibited significantly reduced activity at 200 mg/kg compared to lower doses in the TST. The highest doses of aqueous-ethanolic extract also reduced locomotor activity which will have led to a negative functional interaction with antidepressant-like effects. Qualitative phytochemical analysis revealed that the aqueous-ethanolic extract of V. wallichii was the only separated rhizome fraction containing terpenoids. Furthermore, since the methanolic and aqueous extracts were active in the tests, it is suggested that the antidepressant-like action of this herbal plant is not contingent upon its terpenoid constituents.

5. *Akkalkara* (*Anacyclus pyrethrum*)

बुध्दितीव्र,बैचेनि नाशक, उत्तेजक (निघण्टू आदर्शसहदेव्यादि वर्गः)[30]

a) Scopolamine-Induced Impairment in Conditioning and Exploratory Behaviours is enhanced by *Anacyclus Pyrethrum* in Rats.[31]

Aboufatima Rachida, Mountassir Maryam, Khalki Hanane, Ferehan Hind, Farouk Loubna, Chiguer Fatiha, Najimi Mohamed, Zyad Abdelmajid, Chait Abderrahman

Wistar rats were used in the study. APE was administered in doses of 100 and 200 mg. Learning and exploratory deficits were produced by acute administration of scopolamine (1mg/Kg). The electric shock avoidance and the T. labyrinth tests are used to assess learning and exploration Conclusion: The combination of scopolamine and "APE" show that the APE reverses the power of SCO to decrease the number of conditioned responses and to

disrupt exploration in the rat. These findings indicate that roots of *Anacyclus Pyrethrum* may contain effective compounds that stimulate learning and exploratory activities in rat.

b) Evaluations of antidepressant activity of *Anacyclus pyrethrum* root extract.[32]

S. R. Badhe, R. V. Badhe, M. M. Ghaisas1, V. V. Chopade, A. D. Deshpande

The study was designed to screen antidepressant activity of *Anacyclus pyrethrum* (AP) root extract. An experiment was designed by different method such as Locomotor activity, Haloperidol-induced catalepsy, Forced swim test (FST), Tail suspension test (TST), Clonidine-induced hypothermia and Reserpine-induced hypothermia on Swiss male albino mice. Standard root extract of *Anacyclus pyrethrum* (AP root extract) showed an increase in ambulatory behavior indicating a stimulant effect of the photoactometer. AP root extract produces a significant antidepressant effect in both FST and TST as they reduced the immobility. AP root extract was found to be effective in reversing hypothermia produced by clonidine and reserpine. In study, it is found that AP root extract inhibited haloperidol-induced catalepsy. These study suggest that AP root extract might produce antidepressant effect by interaction with adrenergic and dopamine receptor thereby increasing the level of noradrenaline and dopamine in brains of mice.

6. *Shatavari* (*Asparagus racemoces*)

- शतावरीगुरुःशीतातिक्तास्वाद्वी रसायनी I

मेद्याग्निपुष्टिदा स्निग्धा नेत्र्या गुल्मातिसारजित II (भा. प्र. गुडुच्यादिवर्गः१८६)[33]

- शतावरीहिमातिक्तारसेस्वादुःक्षयास्नजित् I

वातपित्तहरी वृष्या रसायनवरा स्मृता II (ध. नि. गुडुच्यादिवर्गः २९१)[34]

a) Antidepressant and antioxidant activity of Methenolic extract of *Asparagus Racemosus* seeds.[35]

K.Sravani, K.Sivarama Krishna

Methanolic extracts of complex product prepared from dried seeds of plant *Asparagus Racemosus*. In the present study, the antidepressant effect of *Asparagus Racemosus* was examined using two behavioural models, the forced swim test (FST) in rats and tail suspension test (TST) in mice and one invitro model such as estimation of Dopamine levels in rat brain. DPPH & Nitric oxide radical scavenging activity models were selected for antioxidant activity. Conclusion: The effect of 200mg/kg of Asparagus Racemosus wasbetterthan20 mg/kg Imipramine. The effect of 100mg/kg of Asparagus Racemosus was

significant when compare to vehicle treated group. In in-vitro study, *Asparagus Racemosusin* the doses of 100mg/kg and 200mg/kg showed increased levels of Dopamine when compared to that of normal. Plant extract at dose of 200 mg/kg showed increased levels of Dopamine, which is nearly equal to that of Standard.

b) A Phytopharmacological Review on *Asparagus racemosus.*[36]

Deepika Choudhary, Dimple Sharma2

Methanolic extract of *Asparagus racemoces* involve the adrenergic system and enhances the serotonergic mediated behavior indicating the involvement of serotonergic pathway in the antidepressant activity.

c) Antidepressant activity of *Asparagus racemosus* in rodent models.[37]

Singh GK, Garabadu D., Muruganandam AV, Joshi VK, Krishnamurthy S.

Asparagus racemosus Linn. (AR) is an Ayurvedic *rasayana* used as an adaptogen. Adaptogenic drugs are those which are useful as anti-stress agents by promoting non-specific resistance of the body. Although, the adaptogenic effect of AR is well documented, its use in psychological disorders like depression is not scientifically evaluated. Hence, the present investigation evaluates the antidepressant effect of methanolic extract of roots of AR (MAR) standardized to saponins (62.2% w/w). Rats were given MAR in the doses of 100, 200 and 400 mg/kg daily for 7 days and then subjected to forced swim test (FST) and learned helplessness test (LH). The results show that MAR decreases immobility in FST and increases avoidance response in LH indicating antidepressant activity. In behavioral experiments, MAR increased the number of head twitches produced by 5-HTP and increased clonidine-induced aggressive behavior indicating facilitatory effect on both serotonergic and adrenergic systems respectively. However, MAR had insignificant effect on l-DOPA-induced aggressive behavior indicating absence of activity on dopaminergic system. MAR also reversed changes to the endogenous antioxidant system induced by FST. Thus, MAR has significant antidepressant activity and this effect is probably mediated through the serotonergic and the noradrenergic systems and augmentation of antioxidant defenses.

7. Shankhapushpi (*Convolvulus pluricaulis*)

शंखपुष्पी हिमा तिक्ता मेधाकृत स्वरकारिणी I
ग्रहभुतादिदोषघ्नी वशीकरणासिध्दिदा II (रा नि गुडुच्यादिवर्ग १३३)[44]

a) Evaluation of the antidepressant-like activity of *Convolvulus pluricaulis* choisy in the mouse forced swim and tail suspension tests.[45]

Dhingra D, Valecha R.

The petroleum ether (25, 50 mg/kg), chloroform (25, 50, 100 mg/kg), and ethyl acetate (25, 50, 100 mg/kg) fractions were administered orally for 10 successive days to separate groups of Swiss young male albino mice. The effects of the extracts on the mice's immobility periods were assessed in the forced swim test (FST) and tail suspension test (TST). The effects of reserpine (2 mg/kg i.p.), sulpiride (50 mg/kg i.p.), prazosin (62.5 microg/kg i.p.), and p-chlorophenylalanine (100 mg/kg i.p.) on the extracts' antidepressant-like effect in TST was also studied. The extracts' antidepressant-like effect was compared with that of imipramine (15 mg/kg p.o.) and fluoxetine (20 mg/kg p.o.) administered for 10 successive days. The chloroform fraction of the total ethanolic extract of *Convolvulus pluricaulis* elicited a significant antidepressant-like effect in mice by interaction with the adrenergic, dopaminergic, and serotonergic systems.

8. Bramhi (*Bacopa moneria*)

ब्राम्ही हिमा कषाया च तिक्ता वातास्त्रपित्तजित् I

बुध्दि प्रज्ञां च मेधां कुर्य्यादायुष्यवर्ध्दनी II (रा नि पर्पटादिवर्ग ६६)[38]

Antidepressant Activity of Brahmi in Albino Mice.[39]

SLDV Ramana Murty Kadali, Das M.C., and Karuna Sri G

The antidepressant activity was studied in albino mice using forced swimming test (FST), tail suspension test (TST) and shock induced depression (SID). Imipramine (10mg/kg), fluoxetine (30mg/kg) were used as standard drugs and brahmi (10, 20, 30mg/kg) was used as test drug. Brahmi has shown antidepressant activity in FST and SID.

9. Jyotishmati (*Celastrus paniculatus*)

कटु ज्योतिष्मतीतैलं तिक्तोष्णं वातनाशनम् I

पित्तसंतापनं मेधाप्रज्ञाबुध्दि विवर्ध्दनम् II (भा.प्र.)[40]

Behavioral and Biochemical Evidences for Antidepressant-Like Activity of *Celastrus Paniculatus* Seed Oil in Mice.[41]

Rekha Valecha and Dinesh Dhingra

The seed oil (50, 100, and 200 mg/kg, PO) and fluoxetine per se were administered for 14 successive days to Swiss young albino mice. On the 14th day, 60 min after drug administration, animals were subjected to Tail Suspension Test (TST) and Forced Swim Test (FST). The mechanism of action was also studied. *Celastrus paniculatus* seed oil produced significant antidepressant-like effect in mice possibly through interaction with dopamine D_2, serotonergic, and $GABA_B$receptors; as well as inhibition of MAO–A activity and decrease in plasma corticosterone levels.

10. Jatamansi (*Nardostachys jatamansi DC*)

गन्धमासीं तिक्तशीता कफकण्ठामयापहा I
रक्तपित्तहरा वर्ण्या विषभुतज्वरापहा II
अभ्रमासीं हिमा शोफव्रणनाडिरुजापहा I
लूतागर्दभजालादिहारिणी वर्णकारिणी II (रा नि चन्दनादिवर्ग ९७,९९)[42]

Comparative study of antidepressant activity of methanolic extract of Nardostachys Jatamansi DC Rhizome on normal and sleep deprived mice.[43]

Habibur Rahman, P. Muralidharan

The study was undertaken to evaluate the antidepressant activity of methanolic extract of Nardostachys jatamansi DC by forced swim test, tail suspension test and locomotor activity in inbred male Swiss Albino mice weighing 25-30g. The efficacy of the extract (200 and 400 mg/kg, p.o) was compared with the standard drug imipramine (10mg/kg, p.o) on normal and sleep deprived mice. Drugs were administered for 10 days in normal mice groups and the other groups were subjected to 24 hours sleep deprivation by using multiple platforms on 9th day and last dose was given 1 hour before experiment on 10th day. Duration of immobility was noted in both the models. MENJ (200 and 400 mg/kg, p.o) produced significant antidepressant like effect in normal and sleep deprived mice in both TST and FST and their efficacies were found to be comparable to imipramine (10 mg/kg, p.o). It did not show any significant change in locomotor functions of mice as compared to normal control. However, it significantly improves the locomotor activity in case of sleep deprivation which is comparable to normal control. This finding suggests that MENJ has dose dependent antidepressant activity and can also be used in patients suffering from depression due to sleep disturbances.

DISCUSSION

According to world health report, about 450 million people suffer from a mental or behavioral disorder. By the year 2020, depression is expected to constitute the second largest source of global burden of disease after heart disease. Depression is whole body illness which involves not only mood or emotion but also the physical body and thought process. The symptoms of depression are intense feelings of sadness, hopelessness, and despair, as well as the inability to experience pleasure in usual activities, changes in sleep patterns and appetite, loss of energy, and suicidal thoughts.

There are two types of mental depression, namely unipolar depression, in which mood swings are always in the same direction and is common (about 75% of cases) non familial , clearly associated with stressful life events and accompanied by symptoms of anxiety and agitation. The second type is bipolar depression (about 25% of cases) sometimes also called as endogenous depression, shows a familiar pattern, unrelated to external stresses and usually appears in early adult life, results in oscillating depression and mania over a period of a few weeks . Patients with depression have symptoms that reflect decrease in brain monoamine neurotransmitters, specifically norepinephrine, serotonin and dopamine. 500,000/year is diagnosed as suffering from depression.

Although a number of synthetic drugs are being used as the standard treatment for clinically depressed patients, they have adverse effects that can compromise the therapeutic treatment, these common adverse effect include dry mouth, fatigue, gastrointestinal or respiratory problems, anxiety, agitation, drowsiness, and cardiac arrhythmias. Several drug-drug interactions can also occur. These conditions create an opportunity for alternative treatment of depression by used of medicinal plant.

Table 3: Summarizes the various medicinal plants used for their anti-depressant activity.

Sr.No	Plant name	Ayurvedic action	Proven activity
1	*Ashwagandha* (*Withania somnifera*)	बल्या रसायनी	Potential adjuvant in depressive disorders.
2	*Vacha* (*Acorus calamus*)	वृष्या,वातभूतदोषघ्नी, बल्या	Antidepressant-like activity which is mediated by modulating the central neurochemical as well as HPA
3	*Khurasani ova* (*Hyoscyamus niger*)	ग्राहिणी मादिनी	Involvement of biogenic amine in antidepressant action.

4	*Tagar* (*Valeriana wallichi*)	भूतोन्माद भयापहम्	The extract demonstrated antidepressant effect and significantly increased the norepinephrine and dopamine levels in forebrain.
5	*Akkalkara* (*Anacyclus pyrethrum*)	बुध्दितीव्र,बैचेनि नाशक, उत्तेजक	Root extract might produce antidepressant effect by interaction with adrenergic and dopamine receptor thereby increasing the level of noradrenaline and dopamine in brains of mice.
6	*Shatavari* (*Asparagus racemoces*)	रसायनी , वृष्या	Anti-depressant activity. Plant extract at dose of 200 mg/kg showed increased levels of Dopamine, which is nearly equal to that of Standard.
7	S*hankhapushpi* (*Convolvulus pluricaulis*)	ग्रहभुतादिदोषघ्नी	Anti-depressant-like effect in mice by interaction with the adrenergic, dopaminergic, and serotonergic systems
8	*Bramhi* (*Bacopa moneria*)	बुध्दि प्रज्ञां च मेधां कुर्य्यादायुष्यवर्ध्दनी	antidepressant activity
9	Jyotishmati (*Celastrus paniculatus*)	वातनाशनम् , मेधाप्रज्ञाबुध्दि विवर्ध्दनम्	antidepressant-like effect in mice possibly through interaction with dopamin
10	*Jatamansi* (*Nardostachys jatamansi DC*)	नाडिरुजापहा, भुतपहा	Ant-idepressant activity (depression due to sleep disturbances.)

CONCLUSION

Depression affects people of all ages, from all walks of life in all countries. It causes mental torment and impacts on people's ability to carry out even the routine tasks, sometimes with distressing consequences in relationships within family and society. At worst, depression can lead to suicide. According to etiology and pathogenesis the disease can be correlated to avasada, vishada, manodhukhaja unmada and kaphaja unmada and can be treated accordingly seeing all factors. Unlike a physical illness, the reluctance of a person to realize within as having a psychological illness prevents them from approaching a doctor. But once diagnosed, our science of ayurveda offers enough medicines to support them. Plants have always been an important source for finding new remedies for human diseases. Among hundreds of plants that have been studied for diabetes, only a small fraction has been tested in animal studies and is under clinical trials. The observed result may be helpful in planning further scientific

studies about the efficacy of these drugs on prevention as well as management of Depression (Vishad).

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