



An Overview on Medicinal Plant posses Anti-anxiety Activity

Harshita Sharma^{1*}, Raksha Goswami¹, Neetesh Kumar Jain¹ and Deepak Kumawat²

1, Department of Pharmacology, Faculty of Pharmacy, Oriental University, Indore (M.P.) - India

2, Department of Pharmaceutics, Faculty of Pharmacy, Oriental University Indore (M.P.) - India

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Abstract

Anxiety is type of psychiatric illness. Anxiety refers to the experience of fear, restlessness, nervousness, tension, apprehensiveness, panic, and agitation. Nowadays modern life style leads to various degree of anxiety and depression. There are quantity of medicinal plants having significant anxiolytic activity i.e. *Abies pindrow* Royle., *Apocynum venetum* L., *Casimiroa edulis* Llave, *Mangifera indica*, *Momordica charantia* Linn., *Turnera aphrodisiaca* Ward., *Paullina pinnata*, *Withania somnifera* (L.) Dunal, *Zingiber officinale*. etc. There is large number of man-made drugs used for treatment of anxiety but these drugs have many side effects. To avoid this side effect herbal therapies are considered as alternative or complementary medicines for the treatment of neurological disorder.

Key words: Anxiety, Fear, Nervousness, Tension, Herbal therapies, Neurological disorder

Introduction

Anxiety is type of psychiatric illness^[1]. Anxiety refers to the experience of fear, restlessness, nervousness, tension, apprehensiveness, panic, and agitation^[2]. According to American Psychiatric Association (APA) each of Anxiety Disorders emotional reaction due to expectation of future risk^[3]. Nowadays modern life style leads to various degree of anxiety and depression^[4].

Symptoms of anxiety^[5].

Most common symptoms of anxiety are irritability, uneasiness, rapid or irregular heartbeat, jumpiness, feelings of apprehension, nausea, faintness, and abdomen ache and respiration problems.

Pathophysiology of anxiety^[6]

Glutamatergic hyperactivity in brain injuries, liable for varied events such as mitochondrial pathology, oxidative stress, and cellular communication that responsible for inflammatory response and ultimately cell death.

Since glutamatergic overactive is related with characteristic of anxiety, neuro inflammation and n oxidative stress.

Therefore overactive glutamatergic system deregulating in balance of inhibitory/excitatory in the brain is liable for anxient disorder.

Presynaptically situated, mGlu_{2/3} receptors are present in some brain areas where glutamate hyperactivity is associated with anxiety, together with the cortex, amygdale, striatum, thalamus, and hippocampus.

*Corresponding Author

E-Mail: sharshita29@gmail.com

Types of anxiety

There are seven types of anxiety disorder:^[7]

- Panic disorder (PD): Specifier: with or without agoraphobia
- Social phobia (SP): Specifier: generalized
- Specific phobias (SPP): Specifier: animal, environmental, blood-injection injury, situational type
- Post-traumatic stress disorder (PTSD): Specifier: acute versus chronic, with delayed onset
- Acute stress disorder
- Obsessive-compulsive disorder (OCD): Specifier: with poor insight
- Anxiety disorders with generalized anxiety, with panic attacks and with obsessive compulsive symptoms.

Treatment of anxiety disorders

Treatments of anxiety disorders involve:

Lifestyle interventions

Lifestyle interventions, like physical exercise, psychological interventions, like psychological feature behavioral medical aid, which are difficult to implement and mindfulness-based stress reduction^[6].

In Allopathic Medicine^[8]

- First line treatments
 - ✓ Serotonin-Reuptake Inhibitors (SSRIs) example Escitalopram, Fluoxetine, Fluvoxamine, Paroxetine, Sertraline
 - ✓ Serotonin Norepinephrine Reuptake Inhibitors (SNRIs) example Venlafaxine, Duloxetine

- ✓ Benzodiazepines Example Alprazolam, Chlordiazepoxide, Clonazepam, Diazepam, Lorazepam.

- Second line and other treatments for anxiety disorder

- ✓ Tricyclic antidepressants (TCAs) example Clomipramine, Doxepine, Imipramine
- ✓ Monoamine oxidase inhibitors (MAOIs) example Phenelzine
- ✓ Antihistamine example Hydroxyzine
- ✓ Other example Buspirone

Adverse effect of diazepam:

- Common adverse effects of diazepam include:

Sedation, confusion, fatigue, depression, anterograde amnesia, disinhibition, irritability, local injection site reaction, tremor, headache, urinary retention, dystonia, incontinence and nausea.

- Serious adverse effects of diazepam include:

Respiratory depression, suicidality, seizures, bradycardia, cardiovascular collapse, syncope, hypotension, paradoxical CNS stimulation, dependence and abuse.^[9]

➤ Herbal medicine^[10]

Herbal therapies are considered as alternative or complementary medicines for the treatment of neurological disease. Example Abies pindrow Royle, Achyranthes aspera, Aegle marmelos.

Table 1: Plants proved to possess' anxiolytic activity

S.No	Plant Name	Extraction	Dose	Model used	Activity possessed
1	Abies pindrow Royle ^[11]	Ethanollic extract of leaves of Abies pindrow Royle was administrated orally	50mg/kg and 100mg/kg	Elevated plus maze test and Open-field test	Anxiolytic activity
2	Achyranthes aspera ^[12]	Methanolic extract of leaves, of Achyranthes aspera.	100mg/kg, 300mg/kg and 600mg/kg	Elevated plus maze test, light dark exploration and Open field test	Anxiolytic activity
3	Aegle marmelos ^[13]	Methanolic extract of leaves of Aegle marmelos	75mg/kg, 150mg/kg, 300mg/kg	Elevated plus maze test and Tail suspension test	Anxiolytic activity
4	Albizia lebbeck. (L). Benth ^[14]	N-butanolic extract of leaves of Albizia lebbeck.(L)	25mg/kg	Elevated plus maze test.	Anxiolytic activity
5	Angelica archangelica Li	Methanolic extract of leaf, root and whole part of	400mg/kg	Elevated plus maze test	Anxiolytic activity

	nn ^[15]	Angelica archangelica Linn			
6	Angelica sinensis Oliv. Diels ^[16]	Essential oil of Angelica sinensis Oliv. Diels	30mg/kg	Elevated plus maze test and Light-dark model	Anxiolytic activity
7	Aniba riparia Nees Mez ^[17]	Methyl ethers extract of unripe fruit of Aniba riparia Nees Mez.	25mg/kg and 50mg/kg	Elevated plus maze test and Hole board test	Anxiolytic activity
8	Apocynum venetum. L. ^[18]	Ethanollic extract of leaves of Apocynum venetum. L was administrated orally	30mg/kg and 125mg/kg	Elevated plus maze test	Anxiolytic activity
9	Azadirachta indica. A.Juss ^[19]	Aqueous extract of leaves of Azadirachta indica. A. Juss. L was administrated orally	10mg/kg, 20mg/kg, 50mg/kg, 100 mg/kg and 200mg/kg	Elevated plus maze test and Open field test	Anxiolytic activity
10	Barleria buxifolia ^[20]	Aqueous extract of leaf , of Barleria buxifolia	100mg/kg and 200mg/kg	Elevated plus maze test.	Anxiolytic activity
11	Brassica juncea ^[21]	Methanolic extract of leaves , of Brassica juncea	100mg/kg ,200mg/kg and 400mg/kg	Elevated plus maze test , and Open field test.	Anxiolytic activity
12	Casimiroa edulis Llave & Lex ^[22]	Aqueous extract of the leaves of Casimiroa edulis Llave & Lex.	25mg/kg and 35mg/kg	Elevated plus maze test	Anxiolytic activity
13	Cecropia glazioui. Sneth ^[23]	Aqueous extract of the leaves of Cecropia glazioui. Snethin	,250mg/kg and 1000mg/kg	Elevated plus maze test	Anxiolytic activity
14	Centella asiatica. L ^[24]	Methanollic extract of whole plant of Centella asiatica. L	100mg/kg,200mg/kg and 400mg/kg	Elevated plus maze test and Open field test	Anxiolytic activity
15	Citrus aurantium. Linn ^[25]	Essential oil from peel (EOP) and hydroethanolic (70% w/v) extract (HE) from leaves of Citrus aurantium. Linn	500mg/kg and 1000mg/kg	Elevated plus maze test	Anxiolytic activity
16	Coriandrum sativum L ^[26]	Hydroalcoholic extract of fruits of Coriandrum sativum L.	100mg/kg and 200mg/kg	Elevated plus maze test and light – dark test	Anxiolytic activity
17	Cuminum cyminum ^[27]	Ethanollic extract of seeds, of Cuminum cyminum	800mg/kg and 1600mg/kg	Elevated plus maze test , actophotometer and light dark test	Anxiolytic activity
18	Curcumin ^[28]	95% alcoholic extract of turmeric powder	50mg/kg,	Elevated plus maze test.	Anxiolytic activity
19	Davilla rugosa Poiret ^[29]	Hydroalcoholic extract of stem of Davilla rugosa Poiret.	15mg/kg,30mg/kg and 60mg/kg	Elevated plus maze test and open field test	Anxiolytic activity
20	Echium amoenum ^[30]	Aqueous extract of stem of Echium amoenum	5mg/kg,10mg/kg , 20mg/kg , 30mg/kg, 62.5mg/kg, 80mg/kg and 125mg/kg	Elevated plus maze test.	Anxiolytic activity
21	Embllica	Aqueous extract of fruits , of	0.8mg/kg	Bright dark arena	Anxiolytic

	officinalis ^[31]	Emblica officinalis	,2mg/kg and 4mg/kg	and Elevated plus maze test	activity
22	Erythrina velutina Willd ^[32]	Hydroalcoholic extract of the stem bark of Erythrina velutina (orally)	100mg/kg	Elevated plus maze test	Anxiolytic activity
23	Erythrina variegata L ^[33]	Aqueous extract of stem of Erythrina variegata L	100mg/kg, 200mg/kg and 400mg/kg	Elevated plus maze test and open field test	Anxiolytic activity
24	Euphorbia hirta L ^[34]	Methanolic extract of leaves of Euphorbia hirta L.	100mg/kg, 200mg/kg and 300mg/kg	Elevated plus maze test and hole board test.	Anxiolytic activity
25	Euphorbia nerifolia Linn ^[35]	Chloroform extract of leaves of Erythrina variegata Lin	200mg/kg, and 400mg/kg	Elevated plus maze test and open field test.	Anxiolytic activity
26	Ginkgo biloba L ^[36]	Alcoholic butanolic fraction extract of leaves of Ginkgo biloba L.	0.063g/kg-1g/kg	Elevated plus maze test.	Anxiolytic activity
27	Hibiscus rosa sinensis ^[37]	Ethanollic and chloroform extract of flower, of Hibiscus rosa sinensis	50mg/kg,100 mg/kg and 200mg/kg	Open field test.	Anxiolytic activity
28	Hypericum perforatum L ^[38]	50% ethanolic extract of Hypericum perforatum L.	100mg/kg and 200mg/kg	Open field test.	Anxiolytic activity
29	Kielmeyera coriacea Mart. ex Sadd ^[39]	Hydroethanolic extract dichloromethane fraction of stem of Kielmeyera coriacea Mart. ex Sadd	10mg/kg and 15mg/kg	Elevated plus maze test and open field test	Anxiolytic activity
30	Mangifera indica ^[40]	Aqueous extract of leaves , of Mangifera indica	250mg/kg and 500mg/kg	Elevated plus maze test, and stair case model.	Anxiolytic activity
31	Magnolia dealbata Zucc ^[41]	Ethanolic extract of Magnolia dealbata Zucc in.	30mg/kg ,100mg/kg and 300mg/kg	Elevated plus maze test.	Anxiolytic activity
32	Matricaria chamomilla L ^[42]	Hydroalcoholic extract of flower of Matricaria chamomilla L	25mg/kg and 75mg/kg	Elevated plus maze test and FST	Anxiolytic activity
33	Melissa officinalis L ^[43]	Ethanolic extract of Melissa officinalis L	30mg/kg ,100mg/kg and 300mg/kg	Elevated plus maze test and open field test.	Anxiolytic activity
34	Momordica charantia Linn ^[44]	Methanolic extract of Momordica charantia Linn.	200mg/kg	Elevated plus maze test	Anxiolytic activity
35	Murraya koenigii ^[45]	Aqueous extract of Murraya koenigii	300mg/kg and 400mg/kg	Spontaneous motor activity (SMA).	Anxiolytic activity
36	Murraya paniculata ^[46]	Chloroform extract fraction F5 and ethanol extract was partitioned with ethyl acetate (ethyl acetate soluble fraction) of Murraya paniculata	25mg/kg and 20mg/kg	Elevated plus maze test .	Anxiolytic activity
37	Musa sapientum ^[47]	Aqueous extract of stem , of Musa sapientum	25mg/kg ,50mg/kg and	Actophotometer and Elevated plus maze	Anxiolytic activity

			100mg/kg	test.	
38	Nardostachys jatamansi DC ^[48]	Extract of Nardostachys jatamansi DC	250mg/kg	Elevated plus maze test, open field test and light-dark box test.	Anxiolytic activity
39	Nepeta persica Boiss ^[49]	Hydroalcoholic Extract of Nepeta persica Boiss.	50mg/kg and 400mg/kg	Elevated plus maze test	Anxiolytic activity
40	Nyctanthes arbor-tristis Linn ^[50]	Hydroalcoholic extract of leaves of Nyctanthes arbor-tristis Linn	250mg/kg and 500mg/kg	Elevated plus maze test, open field test	Anxiolytic activity
41	Nymphaea lotus (Water Lily) ^[51]	Leaves extract of Nymphaea lotus (Water Lily)	20mg/kg and 40mg/kg	Light dark exploration and open field test.	Anxiolytic activity
42	Ocimum sanctum ^[52]	Ethanol extract of leaves Ocimum sanctum	1.75mg/kg ,4.25mg/kg and 8.5mg/kg	Elevated plus maze test .	Anxiolytic activity
43	Ocimum gratissimum ^[53]	Aqueous extract of Ocimum gratissimum.in	100mg/kg	Elevated plus maze test	Anxiolytic activity
44	Panax ginseng C. A ^[54]	Extract of white and red varieties of Panax ginseng C. A. roots	20mg/kg and 50 mg/kg	Elevated plus maze test and open field test.	Anxiolytic activity
45	Passiflora incarnate Linn ^[55]	Methanolic Extract of Passiflora incarnate Linn	10mg/kg	Elevated plus maze test	Anxiolytic activity
46	Passiflora edulis Sims. E ^[56]	Ethanol , n-butanol and isoorientin Extract of Passiflora edulis Sims. E.	400mg/kg ,300mg/kg and 40mg/kg	Elevated plus maze test.	Anxiolytic activity
47	Paullina pinnata ^[57]	Methanolic extract of leaf , of Paullina pinnata	50mg/kg,	Elevated plus maze test	Anxiolytic activity
48	Piper methysticum G. Forster ^[58]	Ethanol Extract of Piper methysticum G. Forster.	88mg/kg and 125mg/kg	Elevated plus maze test.	Anxiolytic activity
49	Rubus brasiliensis Martius ^[59]	Both infuse and wax ethanol fraction of Rubus brasiliensis Martius	150mg/kg	Elevated plus maze test.	Anxiolytic activity
50	Salvia elegans vahl ^[60]	Hydroalcoholic extract of Leaves and flowers from Salvia elegans	125mg/kg ,250mg/kg and 2000mg/kg	Elevated plus maze test.	Anxiolytic activity
51	Salvia officinalis linn ^[61]	Methanolic extract of dried and ground Leaves from Salvia officinalis linn.	50mg/kg ,100mg/kg and 200mg/kg	Open field test.	Anxiolytic activity
52	Stachys lavandulifolia V ^[62]	Hydroalcoholic extract and essential oil of Stachys lavandulifolia Vahl	100mg/kg	Elevated plus maze test	Anxiolytic activity
53	Sphaeranthus indicus Linn ^[63]	Hydroalcoholic extract of Sphaeranthus indicus Linn	100mg/kg,200mg/kg,500mg/kg	Elevated plus maze test	Anxiolytic activity
54	Tumera aphrodisiaca Ward ^[64]	Mother tinctures of Tumera aphrodisiaca Ward.	50mg/kg,75mg/kg, 100mg/kg, 125mg/kg,150mg/kg	Elevated plus maze test	Anxiolytic activity

55	Tilia Americana L ^[65]	Methanolic extract of Tilia Americana Lin.	100mg/kg	Elevated plus maze test	Anxiolytic activity
56	Uncaria rhynchophylla (Miq.) Jacks ^[66]	Aqueous extract of Uncaria rhynchophylla (Miq.) Jacks	200mg/kg	Elevated plus maze test	Anxiolytic activity
57	Valeriana officinalis L ^[67]	45% Methanolic and 35% ethanolic extract of Valeriana officinalis L	100mg/kg and 500mg/kg	Elevated plus maze test.	Anxiolytic activity
58	Vitex negundo Linn ^[68]	Ethanolic extract of Vitex negundo Linn.	100mg/kg and 200mg/kg	Elevated plus maze test and light-dark test	Anxiolytic activity
59	Withania somnifera (L.) Dunal ^[69]	Glycowithanolides extract from root of Withania somnifera (L.) Dunal	20mg/kg and 50mg/kg	Elevated plus maze test and feeding latency	Anxiolytic activity
60	Zizuphus. spina-christi ^[70]	70% Ethanolic extract of leaves, of Zizuphus. spina-christi	200mg/kg	Elevated plus maze test	Anxiolytic activity
61	Zingiber officinale ^[71]	Ginger extract	200mg/kg	Elevated plus maze test	Anxiolytic activity

Conclusion

Synthetic anti-anxiety drugs like diazepam used for anxiety treatment causes many adverse effects such as sedation, confusion, fatigue, depression, anterograde amnesia, disinhibition, irritability, local injection site reaction, tremor etc.,. Some adverse effect is common while some are severe such as Respiratory depression, suicidality, seizures, bradycardia, cardiovascular collapse, syncope etc which is effect patient's health severely. To overcome from this; natural medicinal plant considered as alternative or complementary medicines for the treatment of anxiety with fewer and no side effects. Medicinal plants parts like leaves, steam and roots contain many chemical constituents such as flavanoids, minerals, vitamin, amino acid which is directly and indirectly help to reduce anxiety. In present study, we studied 61 medicinal plants that posses significant anxiolytic activities at different doses using elevated plus maze test, actophometer and open field models respectively. The aim of our study to search new treatment of anxiety which is more efficient causes minimum side effect, lower toxicity and also economical for patients.

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