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## The most common native medicinal plants used for psychiatric and neurological disorders in Urmia city, northwest of Iran

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## ABSTRACT

**Objective:** To determine and introduce medicinal plants used in the treatment of psychological disorders in Urmia city of Iran.

**Methods:** Direct observation, interviews and collection of herbarium native medicinal herbs were used in this study. Questionnaires included herbalists' personal information, native herbs list to include local name of plant, used organ, application methods and therapeutic effect of the plant. Samples that listed in the questionnaires were collected to determine the genus and species.

**Results:** By interviews, 22 medicinal plants of 10 families were determined in Urmia city. Asteraceae family had the most therapeutic effects (32%). Seeds of plants were the most used organs and common application method of plants was decoction (80%).

**Conclusions:** Indigenous knowledge of medicinal plants offers new ideas for modern pharmaceutical science. These study results might be tested experimentally in order to produce new herbal remedies for management of neurological and psychiatric disorders.

### 1. Introduction

Pain is one of the main problems which for years, humans have been trying to find out a way to get rid of[1]. Pain occurs in acute and chronic forms. Both can be seen as limiting disability causes that prevent individuals of doing daily activities[2]. Trying to find a way to eliminate pain began when the man knew the pain[3]. Pain is one of the main problem of various diseases[4]. Long period pains will lead to adverse psychological outcomes. Therefore, relieving pains or curing of the diseases is essential[5]. Nowadays, analgesics are non-steroidal anti-inflammatory

drugs and opioids that may not be used in all cases due to their probably adverse effects[6].

According to the World Health Organization report, depression as the second reason of disability after cardiovascular diseases resulting causes severe social and economic deficits[7].

Anxiety disorders are the most common mental disorders in communities. Almost 30 million people are suffering of this disorder in the United States[8]. Insomnia is one of the most common disorders that chronically, many people are suffered from it for different reasons[9].

Convulsion is abnormal discharge of a group of neurons in the central nervous system, and may occur in different clinical forms depending on the discharge rate and its spreading. Epilepsy is a chronic disorder which is associated with alteration in mental processes, state

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of consciousness or involuntary movements. Epilepsy prevalence in different populations is estimated at 0.3 to 0.5 percent and its rate is higher in developing countries[10].

Traditional medicine with its thousands years history gives fundamental and comprehensive solutions to resolve some of the health problems of the community. Recent studies have also shown promising results from the use of these compounds in the treatment of conditions such as pain[11–13], stress and anxiety[14–16], schizophrenia[17], cognition deficit or Alzheimer[18,19] and cardiovascular diseases[20–22].

The uses of plants, always have been popular among Iranians[23–36]. With regard to the incidence and prevalence of neurological and psychiatric disorders in the community, the aim of this study was to determine and introduce medicinal plants used in the treatment of psychological disorders in Urmia city of Iran.

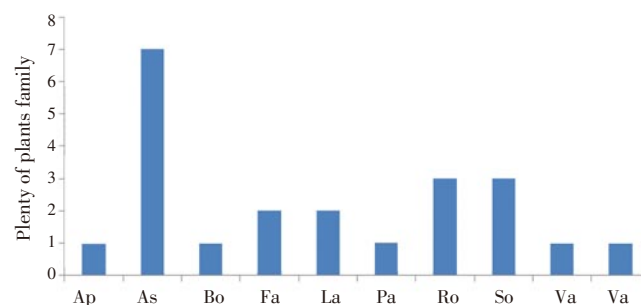
## 2. Materials and methods

This study was done from October 2013 until December 2013, based on completing provided questionnaires and interviews using non documental folk resources. Data were collected from herbalists of the Urmia city, direct observation and collection of native medicinal plants and asking about usual effectiveness on mental diseases. The questionnaires included personal information of herbalists, native plants therapeutic effects and their used organs with method of using without naming the plants. All collected specimens were prepared separately and labeled with name, therapeutic effects with their traditional use. A total of 42 samples of herbarium plants were collected based on local herbalists information in questionnaires. Samples were sent to Urmia Agricultural Research Center and Agriculture Faculty of Urmia University for genus and species determination using various scientific sources.

## 3. Results

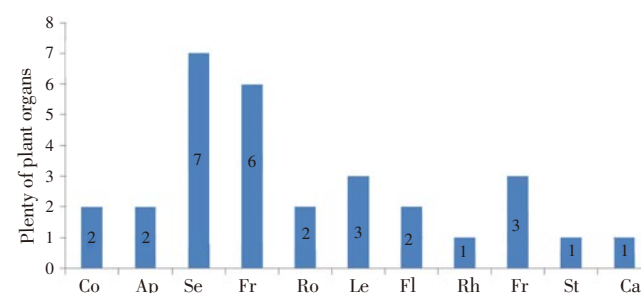
Due to surveying and data collection based on questionnaires, interviews and plant sampling, a total of 21 medicinal plants of 10 families were identified which were used in the treatment of neurological and psychiatric disorders. Ethno-botanic information of the identified plants is shown in Table 1. Plants of the Asteraceae family were used more than the other families (Figure 1). Herb seeds and flowering shoots were used more often than other parts of medicinal plants (Figure 2). Most of the medicinal

plants were consumed as decoction (Figure 3). Most of the effects of traditional treatment and its number is indicated in Figure 4.



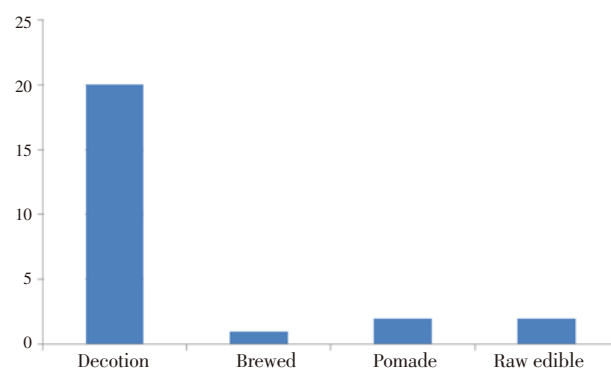
**Figure 1.** Plenty of plants family with medicinal effects used for neurological and psychiatric disorders treatment.

Ap: Apiaceae, As: Asteraceae, Bo: Boraginaceae, Fa: Fabaceae, La: Lamiaceae, Pa: Papaveraceae, Ro: Rosaceae, So: Solanaceae, Va: Valerianaceae.

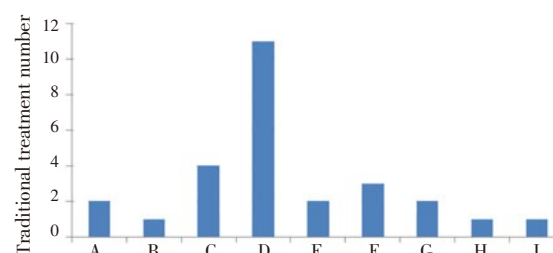


**Figure 2.** Plenty of plant organs used for neurological and psychiatric disorders treatment.

Co: corymb, Ap: aerial parts, Se: seed, Fr: flowering roots, Ro: root, Le: leaf, Fl: flower, Rh: rhizome, Fr: fruit, St: stem, Ca: capsule.



**Figure 3.** Plenty of traditional using methods of understudying medicinal plants.



**Figure 4.** Effects of traditional treatment and its number.

A: relieve chest pain, B: epilepsy, C: sedative, D: tranquilizer, E: headache, F: the nerves restorative, G: depression, H: rheumatism, bone and muscle pain, I: hypnagogic.

**Table 1**

Ethno-botanic information of medicinal plants used in neurological and psychiatric disorders.

Scientific name	Family	Persian name	Used organ	Using method	Traditional therapeutic effect
<i>Achillea millefolium</i> L.	Asteraceae	Boumadaran	Corymb	Decoction	Anticonvulsant, antiepileptic
<i>Alhagi camelorum</i> Fisch	Fabaceae	Khar-shotor	Aerial organs	Decoction	Lumbago
<i>Amygdalus kotschy</i> Boiss.	Rosaceae	Badam	Seed	Decoction	Narcotic
<i>Anthemis tinctoria</i> L.	Asteraceae	Babouneh zard	Flowering shoot	Decoction, pomade	Nerve tonic, sedative
<i>Centaurea cyanus</i> L.	Asteraceae	Gole gandom	Corymb	Decoction	Narcotic
<i>Cichorium intybus</i> L.	Asteraceae	Casni	Root, Leaf, Flower, Seed	Decoction	Nerves tonic
<i>Coronilla varia</i> L.	Fabaceae	Yonja baghi	Leaf	Raw edible, decoction	Sedative
<i>Datura stramonium</i> L.	Solanaceae	Tatoureh	Seed	Decoction, pomade	Sedative
<i>Echium italicum</i> L.	Boraginaceae	Gaw zaban	Flowering shoot	Decoction	Anticonvulsant, sedative
<i>Hypericum perforatum</i> L.	Asteraceae	Alaf chai	Flowering shoot	Decoction	Headache, sedative
<i>Inula oculus-christi</i> L.	Asteraceae	Mosaffaye cheshme masih	Flowering shoot	Decoction	Rheumatism, myalgia, bone, pain
<i>Valeriana officinalis</i> L.	Valerianaceae	Sonbol altaieb	Root, Rhizome	Decoction	Hypnotic, sedative
<i>Papaver rhoeas</i> L.	Papaveraceae	Shaghaiegh	Seed capsule	Decoction	Narcotic, sedative
<i>Pimpinella affinis</i> Ledeb.	Apiaceae	Taretizake baghi	Flowering shoot, Seed	Decoction	Relieving chest pain
<i>Pyrus salicifolia</i> Pall.	Rosaceae	Golabi	Fruit	Fresh food	Nerve tonic
<i>Solanum dulcamara</i> L.	Solanaceae	Taj rizie pich	Stem	Decoction	Sedative
<i>Solanum nigrum</i> L.	Solanaceae	Taj rizi	Fruit, Seed	Decoction	Sedatives, antidepressant
<i>Stachys lavandulifolia</i> Vahi.	Lamiaceae	Chaie alafi	Flowering shoot	Decoction	Narcotic
<i>Tanacetum parthenium</i> (L.) Schultz.	Asteraceae	Babouneyeh kabir	Leaf, Flower	Decoction	Anti-headaches
<i>Ocimum basilicum</i> L.	Lamiaceae	Reihan	Aerial organs	Decoction	Sedative
<i>Cydonia oblonga</i> Mill.	Rosaceae	Beh	Fruit, Seed	Decoction	Sedative

#### 4. Discussion

Results of this study presented the medicinal plants in use for the treatment of neurological and psychiatric disorders. Different parts of the plants and various using methods were applied for this purpose.

Nowadays, chamomile as a herb of the Asteraceae family is used widely with anti-inflammatory, spasmolytic and sedative features[37]. This plant is also capable of inhibiting increase in cyclic adenosine monophosphate, induced by morphine withdrawal[38,39]. Aqueous and ethanol extracts of flowers of this plant have anti-inflammatory, antispasmodic, sedative and anti-agitation effects. It is also applied for neurological digestive disorders, travel disease and colds[40].

*Achillea* plants are used in numerous cases such as blood hemostasis, menstrual disorders, hemorrhoids, hematuria, insomnia, visual disturbances, epilepsy and acute or chronic gastritis. The most important compounds in *Achillea millefolium* include essential oils, polyphenols, some types of flavons, lactones, betaines, acetylene compounds, resin, tannin, anilin phosphates, nitrates, potassium salts and organic acids[41]. Tannins, aromas and bitter substances of *Achillea* are effective on the nervous system and heart. This medicinal plant is used in other cases such as general fatigue, heart failure, kidney stones and also in neurological diseases such as neurasthenia, hysteria, epilepsy and seizures[42,43].

*Datura* plant has been recommended as an analgesic in Iranian ancient medicine[44]. In recent years, this

plant is used as hallucinogen in European and American communities. Presence of alkaloids and alkaline compounds is the main cause of these symptoms[45]. Other species of *Datura* scientifically named *Datura innoxia* Miller is used in traditional medicine to treat seizures and nervous pains such as pain in the face and headache[46]. Important alkaloids of *Datura* are hyoscyamine, atropine, scopolamine and hyoscyne, which have antagonistic effects on muscarinic receptors[47–49]. *Datura stramonium* is used as an antispasmodic and anticholinergic[49].

*Datura fastuosao* has analgesic effects[50]. The previous studies indicate that muscarinic alkaloids of *Datura* plants are able to reduce pain through the central nervous system[51,52].

Basil (*Ocimum basilicum*) contain many compounds including monoterpenes (carrone, thujone, and myrcene, linalol, geraniol, fenchone, cineole), tri-terpenoids (ursolic acid), sesqui-terpenoids, farnesol and caryophyllene and flavonoids (apigenin)[53–55]. The brewed form of this plant in traditional medicine used as anticonvulsant, strengthen, tonic, diuretic, digestive amplifier, anti-bloating, anti-dizziness, relievers of abdominal cramps and anti-coughing[56,57]. Basil extract is likely able to interact with the opioid system. Excitatory amino acids are involved in the development of withdrawal syndrome[58]. Linalol of this plant blocks L-glutamate activity in the *in vitro* experiments (as a competitive antagonist of glutamate) and *in vivo* experiments (seizures), Quin, N-methyl-D-aspartic acid and glutamate release is reduced[59,60]. Anticonvulsant effect, removing migraine headache, tension headaches

and treatment of gastrointestinal origin headaches are the basil's therapeutic effects[56].

In traditional medicine, valerian is used for refreshment and relaxation, treatment of seizures, tension pains and muscle cramps. Valerian root and rhizome are used to treat neurological disorders such as epilepsy, insomnia, dizziness, palpitations, traditionally[61]. Valerian root contains tannin, glucose, various salts, oils, acids, valerenic acid (normal valeric acids) (formic acid, acetic acid, propionic acid and valepotriate[61,62]. Valepotriates are terpenoids made in valerian root that was extracted by dichloromethane. The valerian extract induces releasing of GABA in GABAergic nerves and also reduces its reabsorption[63]. According to the report of Yuan *et al.*, valerinic acid can be attached to GABA receptors in GABAergic nerves and can mimic the activity of GABA[64]. Activation of the GABAergic system causes anxiety reduction[65,66], so valpotriate anxiolytic effects can be attributed to activation of this system.

Papaveraceae plants like poppy have various alkaloids such as readine, readic acid, papaveric acid, meconic acid, mucilage and sugar. These plants are useful for insomnia and inflammation reduction and have narcotic and expectorant effects. Due to existence of small amount of morphine in the extract, the extract is called harmless opium[67–71]. Several compounds with biological activities as antidepressants, antimicrobial and anti-inflammatory effects of these species are: hypericin (naphthodianthrone), pseudohypericin, flavonoids like quercetin and phloroglucinol with various effects[72].

In recent years, *Hypericum perforatum* has been used as an alternative treatment for mild to moderate depression[73]. Previous studies considering the positive results of the different species of *Hypericum* are in Indian, Spanish, Pakistani and Egyptian where *Hypericum* has anti-inflammatory and analgesic effects. Iranian native *Hypericum* has similar therapeutic effects[74,75].

*Cichorium intybus* is another used plant of the traditional medicine in Iran. Pharmaceutical parts of the plant are roots and aerial organs[76]. *Cichorium intybus* has neuroprotective and antioxidant properties and can prevent neurons damage due to free radicals of oxygen[77].

Unsaturated fatty acids are essential for fetus growth and neurons development[78]. Three essential fatty acids known as omega-3 includes: alpha linoleic acid, eicosapentaenoic acid and docosahexaenoic acid[79–81]. A diet rich in almond creates a harmonious environment for maintaining structure of old cell in brain[82].

Docosahexaenoic acid reduction causes human neuronal degenerative diseases like Alzheimer disease.

Docosahexaenoic acid protects rat brain against toxicity and prevents seizure-like activity in the rat hippocampus[79].

Perhaps almond oil prevents interference in fatty acid metabolism in the hippocampus due to change in the synthesis and releasing of central neurotransmitters and diminishing in learning and memory[83].

Indigenous knowledge of medicinal plants has offered new interesting ideas for modern pharmaceutical science[84–93]. This study results should be tested experimentally in order to produce new herbal remedies for the treatment of neurological and psychiatric disorders.

### Conflict of interest statement

We declare that we have no conflict of interest.

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