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## The most important medicinal plants affecting the brain and nerves: An overview on Iranian ethnobotanical sources

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### ABSTRACT

Medicinal plants have been used traditionally to treat neurological disorders. The aim of this study was to report the medicinal plants used to treat these disorders in ethnobotanical resources of Iran. Traditional remedial information of this study was obtained by searching common key words such as neurological disorders, neurodegenerative diseases, mental illness, and medicinal plants in scientific databases including ISI Web of Science, PubMed, Scopus, Islamic World Science Citation Database (ISC), Magiran and Scientific Information Database (SID) of Iran. Several medicinal plants up to 71 species are used as effective remedies on neurological disorders in different cities, regions and provinces of Iran such as Arasbaran, Jandagh, Khuzestan, Sirjan, Sistan, north of Iran, Mobarakeh, Marivan, Kashan, West Azarbaijan, Ilam. Medicinal plants show their therapeutic effects due to the presence of antioxidants, flavonoids, flavonoids, tannins, anthocyanins activities and so on.

**Key words:** Medicinal plants, Ethnobotay, Neurological disorders, Iran.

### INTRODUCTION

Infectious and noninfectious diseases are growing increasingly [1-9]. Epidemiological knowledge about prevention, control and treatment of diseases is particular importance (10-28). Medicinal herbs have long been used in diseases treatment [29-34]. The most common active ingredients in fruits, vegetables and medicinal herbs are phenolic and nitrogenic compounds, vitamins, terpenoids, carotenoids, triterpenes and alkaloids that some of them have potent antioxidant activities [35-39]. Medicinal herbs are always a rich source of natural remedies affecting various infectious and non-infectious diseases such as: toothache, headache and migraine, infectious diseases, neurodegenerative disorders, gastrointestinal diseases, hyperlipidemia, skin problems, gastric ulcer, dysmenorrhea, respiratory disorders, wounds, pain, colds, parasites, diabetes, hypertension, disorders of the reproductive system and others [40-59]. Antioxidants play an important role in human life and most of the therapeutic effects of medicinal plants are due to these compounds [60-67]. Medicinal plants were used traditionally to treat neurological disorders. The aim of this study was to report of all medicinal plants used to treatment of these disorders in ethnobotanical resources of Iran.

Traditional remedial information of this study was obtained by searching common key words such as neurological disorders, neurodegenerative diseases, mental illness, and medicinal plants in scientific databases including ISI Web of Science, PubMed, Scopus, Islamic World Science Citation Database (ISC), Magiran and Scientific Information Database (SID) of Iran.

Obtained results of this study showed that 72 types of herbs were used as medicinal plants for treatment of neurological disorders in different regions of Iran. These native plants of Iran are listed in Table 1.

**Table 1. medicinal plants native to different regions of Iran (Persian name, scientific name, and used parts) affecting the brain and nerves**

No	Scientific name	Family name	Persian name	Used organ	Traditional therapeutic effect	Different regions of Iran
1	<i>Cichorium intybus</i>	Compositae	Kasni	Root, Leaf	Nerve tonic	Arasbaran [68]
2	<i>Anthemis nobilis</i>	Compositae	Babooneh	Flower	Antiepileptic	Arasbaran [68]
3	<i>Juniperus communis</i>	Cupressaceae	Pirow	Fruit	Hypnotic	Arasbaran [68]
4	<i>Hypericum perforatum</i> L.	Hypericaceae	Alaf chai	Flowering shoot	Antidepressants	Arasbaran [68]
5	<i>Leumurus cardiaca</i>	Labiatae	Dome shir	Aerial organs	Antiepileptic	Arasbaran [68]
6	<i>Origanum vulgare</i>	Labiatae	Marzanjoosh	Flowering shoot	Migraine headaches relief , toothache relief	Arasbaran [68]
7	<i>Ballota nigra</i>	Labiatae	Anjideh siah	Aerial organs	Neurological disorders , neurasthenia	Arasbaran [68]
8	<i>Papaver orientale</i>	Papaveraceae	Kashkhash shargee	Plant sap	Analgesic and hypnotic	Arasbaran [68]
9	<i>Lotus corniculatus</i>	Papilionaceae	Ahoomash zard	Flower, Fruit	Antiepileptic, Anti-anxiety	Arasbaran [68]
10	<i>Crataegus monogyna</i>	Rosaceae	Zalzalak	Fruit	Anti-anxiety	Arasbaran [68]
11	<i>Asperula odorata</i> L.	Rubiaceae	Shirpanir	-	Sedative	Arasbaran [68]
12	<i>Hyoscyamus niger</i>	-	Bangdaneh	Leaf, Seed	Hypnotic, Narcotic	Arasbaran [68]
13	<i>Hymenocater bituminosus</i> Fisch. & C.A.Mey	Lamiaceae	Gol arvaneh	Flower	Analgesic	Jandagh [69]
14	<i>Allium cepa</i> L.	Amaryllidaceae	Piaz	Onion	Anti-toothache	Khoozestan [70]
15	<i>Ferula gumosa</i> Boiss.	Apiaceae	Barijeh	Resin	Analgesic, Antiepileptic	Khoozestan [70]
16	<i>Heracleum persicum</i> Desf.ex Fischer.	Apiaceae	Golpar	Flower	Antiepileptic	Khoozestan [70]
17	<i>Kelussia odoratissima</i> Mozaff.	Apiaceae	Karafs koohi	All parts	Analgesic	Khoozestan [70]
18	<i>Pimpinella anisum</i>	Apiaceae	Anison	Fruit	Analgesic	Khoozestan [70]
19	<i>Trachyspermum copticum</i> L.	Apiaceae	Zenyan	Fruit, Seed	Analgesic	Khoozestan [70]
20	<i>Angelica archangelica</i> L.	Apiaceae	Bovineh	Flower	Antiepileptic	Khoozestan [70]
21	<i>Centurea depressa</i>	Asteraceae	Gol gandom	Stem	Analgesic	Khoozestan [70]
22	<i>Lactuca virosa</i> Habl.	Asteraceae	Kahoo vahshi	All parts	Analgesic	Khoozestan [70]
23	<i>Brassica napus</i> L.	Brassicaceae	Shalgham	Root	Analgesic	Khoozestan [70]
24	<i>Echium amoenum</i> Fisch. & Mey.	Boraginaceae	Gol gawzaban	Flower	Analgesic	Khoozestan [70]
25	<i>Lavandula angustifolia</i> mill.	Lamiaceae	Ostokhodous	Flower	Analgesic	Khoozestan [70]
26	<i>Melissa officinalis</i> L.	Lamiaceae	Badranjbooyeh	Flower, Leaf	Analgesic	Khoozestan [70]
27	<i>Mentha longifolia</i> L.	Lamiaceae	Pooneh	Flower, Leaf	Analgesic	Khoozestan [70]
28	<i>Scutellaria latevijflora</i> L.	-	Faranjmoshk	Seed	Hypnotics	Khoozestan [70]
29	<i>Fumaria parviflora</i> Lam.	-	Shahtareh	Aerial organs	Analgesic	Khoozestan [70]
30	<i>Avena sativa</i> L.	Poaceae	Jo dosar	Seed	Anti-Stress	Khoozestan [70]
31	<i>Crataegus curvisepala</i> Lindm.	Rosaceae	Zalalak siseh	Flower, Leaf, Fruit	Analgesic	Khoozestan [70]
32	<i>Rubia tinctorum</i> L.	Rubiaceae	Roonaas	Root	Hypnotics, Antidepressants	Khoozestan [70]
33	<i>Citrus bigardica</i> Duh.	Rutacea	Baharnarenj	Flower	Antidepressants	Khoozestan [70]
34	<i>Verbascum pseudonobile</i> Stoj & Stef.	Scrophulariaceae	Gole mahour	Flower	Antiepileptic	Khoozestan [70]
35	<i>Hyoscyamus orthocarpus</i> Schönb-Tem.	Solanaceae	Bazrolbanj	Leaf, Seed	Analgesic	Khoozestan [70]
36	<i>Cannabis sativa</i>	Cannabaceae	Shahdaneh	Leaf, Seed	Analgesic , Hypnotics	Sirjan, Kerman [71]
37	<i>Dianthus crinitus</i>	Caryophyllaceae	Mikhak torki	Seed	Mental illness	Sirjan, Kerman [71]
38	<i>Echium amoenum</i>	Boraginaceae	Gol gawzaban	Flower	Analgesic , Hypnotics	Sirjan, Kerman [71]
39	<i>Lithospermum arvense</i>	Boraginaceae	Sangdaneh khor drow	Leaf, Root	Analgesic	Sirjan, Kerman [71]
40	<i>Myrtus communis</i>	Myrtaceae	Mored	Leaf, Fruit	Analgesic	Sirjan, Kerman [71]
41	<i>Datura imoxia</i> Mill.	Solanaceae	Tatoureh	Stem	Analgesic	Sistan [72]
42	<i>Portulaca oleracea</i> L.	Portulacaceae	Kharfeh	Leaf	Migraine headaches relief	Sistan [72]
43	<i>Solanum nigrum</i> L.	Solanaceae	Tajrizie siah	Leaf, Seed	Analgesic, Sedative	Sistan [72]
44	<i>Anthemis cotula</i> L.	Asteraceae	Babooneh bahari	Corymb	Sedative	Sistan [72]
45	<i>Heliantus annus</i> L.	Asteraceae	Aftabgardan	Flower, Seed	Nerve tonic	Sistan [72]
46	<i>Ocimum basilicum</i> L.	Lamiaceae	Reihan	Flowering shoot	Hypnotics	Sistan [72]
47	<i>Nepeta pungens</i> (Bunge.) Benth.	-	Pooneh sai	-	Sedative	North of Iran [73]
48	<i>Stachys lavandolifolia</i> Vahl.	-	Chay koohi	-	Sedative	North of Iran [73]
49	<i>Verbascum thapsus</i> L.	-	Banafsheh moattar	-	Sedative	North of Iran [73]
50	<i>Ziziphora</i> sp.	-	Kakooti	-	Sedative	North of Iran [73]
51	<i>Anethum graveolens</i> L.	Apiaceae	Shweed	-	Antiepileptic	Kazeroon [74]
52	<i>Achillea tenuifolia</i> Lam.	Asteraceae	Boumadaran	-	Nerve tonic	Kazeroon [74]
53	<i>Cuscuta kurdica</i> Engelm.	Cuscutaceae	Sos	-	Antidepressants	Kazeroon [74]
54	<i>Hypericum triquetrifolium</i>	Hypericaceae	Gole race	Flower	Antidepressants	Kazeroon [74]
55	<i>Lycopus europaeus</i> L.	Lamiaceae	Paye gorg	-	Anti-stress	Kazeroon [74]
56	<i>Melissa officinalis</i> L.	Lamiaceae	Badranjbooyeh	-	Sedative	Kazeroon [74]
57	<i>Avena wiestii</i> Steud.	Poaceae	yolaf	Leaf	Anti-stress	Kazeroon [74]
58	<i>Crataegus aronia</i> (L.)Bosc. Ex	Rosaceae	Zalzalak	-	Hypnotic	Kazeroon [74]
59	<i>Datura stramonium</i> L.	-	Batoureh	-	Antiepileptic	Kazeroon [74]
60	<i>Eucalyptus camaldulensis</i> Dehnh	Myrtacea	Okalptus	Leaf	Headache relief	Mobarakeh Esfahan [75]
61	<i>Gundelia tournefortii</i> L.	-	Kangar khouraki	All parts	Memory enhancement	Mariwan Kordestan

						[76]
62	<i>Satureja hortensis</i> L.	-	Marzeh	Aerial organs	Analgesic	Mariwan Kordestan [76]
63	<i>Lagochilus macrocanthus</i> Fisch. & C. A. Mey	-	Lab khagoushi	Flower	Nerve tonic	Natanz, Kashan [77]
64	<i>Cynodon dactylon</i> (L.) Pers	<b>Poaceae:</b>	Morgh	Leaf	Analgesic	Natanz, Kashan [77]
65	<i>Althaea officinalis</i> L.	Malvaceae	Hero	Fruit, Leaf	Migraine headaches relief	West Azerbaijan [78]
66	<i>Coriandrum sativum</i> L.	Apiaceae	Gheshniz	Leaf	Analgesic	West Azerbaijan [78]
67	<i>Achillea biebersteinii</i> Afan.	-	Boumadaran	Leaf	Sedative	Ilam [52]
69	<i>Amygdalus arabica</i> Olivier.	Rosaceae	Badam kouhi	Fruit	Pain relief	Ilam [52]
70	<i>Cerasus microcarpa</i> (C.A.	Rosaceae	Albalouye vahshi	Fruit	Sedative	Ilam [52]
71	<i>Fritillaria imperialis</i> L.	Liliaceae	Ashke maryam	-	Sciatic pain relief	Ilam [52]
72	<i>Papaver dubium</i> L.	Papaveraceae	Khashkhash tannaz	Leaf, Flower	Sedative	Ilam [52]

## DISCUSSION

Several medicinal plants up to 71 species are used as effective remedies on neurological disorders in different cities, regions and provinces of Iran such as Arasbaran, Jandagh, Khuzestan, Sirjan, Sistan, north of Iran, Mobarakeh, Marivan, Kashan, West Azarbaijan, Ilam which some of these plants have common effects and some of them grow in specific area. In the ancient times, chemical drugs were not available to the public or their supplying were difficult, thus traditional therapists prescribed medicinal plants to people according to ethnobotanical knowledge and experience for treatment of diseases. Nowadays modern medicine tend to treat diseases by medicinal plants (79-85). Medicinal plants contain ingredients that can have a variety of useful medicinal effects on the cardiovascular, digestive, respiratory, nervous, circulatory, skeletal and muscular systems (86-94). These active ingredients are mostly phenolic compounds including flavonoids, flavonoids, tannins, anthocyanins, and so on (95-101). These compounds have antioxidant activities (102-116). Neurological disorders are associated with increase in oxidative stress and plants antioxidants are able to diminish the oxidative stress which deteriorates the neurological disorders. Hence, the plants presented in this paper may affect neurological disorders, in part, by their antioxidant activities. If we accept this hypothesis, other plants with antioxidant property () should have the same properties.

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