

## SCREENING OF IRANIAN PLANTS FOR ANTIFUNGAL ACTIVITY: PART 2

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### ABSTRACT

In this study, 278 species from 37 families of native Iranian plants were screened for in vitro antifungal activity against 19 fungal strains. Initially, the crude extracts in concentration of 100 µg/ml were tested. Among 278 plant extracts, 201(71.27%) of them showed antifungal activity against at least one fungal strain. A wide range of total extracts of different species were shown to have potentially noticeable antifungal effects. The outstanding species were: *Mentha longifolia*, *Salvia multicaulis*, *Thymus transcaspicus*, *Zataria multiflora*, *Glycyrrhiza glabra*, *Hulthemia persica*, *Heracleum persicum*, *Pimpinella anisum*, *Pragnos ferulacea*, *Pragnos uloptera*, and *Viola odorata*.

**Keywords:** Iranian plants, Antifungal activity, *Leguminosae* family, *Labiatae*

### INTRODUCTION

As a result of a joint project on medicinal plants between the Department of Pharmacognosy, and Department of Medical Parasitology and Mycology, the biological activities of some native Iranian plants have previously been reported (1-3). In continuation of this project, antifungal activity of a number of other native Iranian plants is reported in this paper. The plants of this investigation were gathered from different locations of Iran since 1984 and some of them are usually used by rural inhabitants as herbal medicine.

### MATERIALS AND METHODS

#### *Plant material:*

The plants materials were collected from different regions of Iran and dried under laboratory condition. The voucher specimens were prepared and authenticated (4-7).

The herbarium samples are kept at the Herbarium of Department of Pharmacognosy, School of Pharmacy, Tehran University of Medical Sciences.

#### *Extraction procedure:*

The air-dried plant materials were grounded into fine powders and extracted in a soxhlet extractor with 80% methanol. After filtration of total

extracts, the solvents were removed under reduced pressure and residues were kept in sterile vials with certain codes at 4°C.

**Table 1.** The microorganisms that were used in the antifungal activity screening of plants

No.	Microorganisms	No.	Microorganisms
1	Candida albicans	11	Epidermophyton floccosum
2	Aspergillus niger	12	Saccharomyces cerevisiae
3	Aspergillus fumigatus	13	Sporotrix schenckii
4	Microsporum canis	14	Cladosporium verbegei
5	Microsporum gypseum	15	Penicillium notatum
6	Trichophyton violaceum	16	Cryptococcus neoformans
7	Trichophyton verrucosum	17	Mucor ramosissimus
8	Trichophyton schoenleinii	18	Pseudoallesheria boydii
9	Trichophyton mentagrophytes	19	Candida parapsilosis
10	Trichophyton rubrum		

#### *Antifungal screening:*

The crude extracts were tested in concentration of 100 µg / ml against organisms listed in table 1, by the general procedure described previously (8). The fungi were cultured on Sabouroud Dextrose Agar and the growth of fungi was achieved at 25-

Table 2. Iranian plants tested for antifungal activity (Wa: Whole above ground, Fr: Fruit, Fl: Flower, B: Bulb, L: Leaves, W: Whole plant)

Family Name	Botanical Names	Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Labiatae	<i>Ajuga Chamaecristis</i> Ging. ex Benth.	Wa	-	-	+	+	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
Labiatae	<i>Dracocephalum Moldavica</i> L.	Wa	-	+	+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
Labiatae	<i>Eremostachys labiosiformis</i> (M. Pop.) Knorring	Wa	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Eremostachys macrophylla</i> Mombr. & Auch.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
Labiatae	<i>Hymenocrater bituminosus</i> Fisch. & C.A.Mey.	Wa	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Hymenocrater elegans</i> Bunge.	Wa	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Labiatae	<i>Lallemantia Royleana</i> (Benth. in Wall.) Benth.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Leonurus cardiaca</i> L.	Wa	-	+	+	+	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-
Labiatae	<i>Marrubium anisodon</i> C.Koch.	Wa	-	+	-	+	+	+	-	+	+	-	+	-	-	-	-	-	-	-	-
Labiatae	<i>Marrubium astracanicum</i> Jacq.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Labiatae	<i>Marrubium crassidens</i> Boiss.	Wa	-	-	-	+	-	+	+	+	-	-	+	-	-	-	-	-	-	-	-
Labiatae	<i>Mentha longifolia</i> (L.) Hudson.	Wa	-	+	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Labiatae	<i>Mentha pulegium</i> L.	Wa	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Micromeria persica</i> Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Nepeta crassifolia</i> Boiss. & Buhse	Wa	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Nepeta fissa</i> C.A.Mey.	Wa	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Nepeta glomerulosa</i> Boiss.	Wa	-	-	-	-	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-
Labiatae	<i>Nepeta racemosa</i> Lam.	Wa	-	+	-	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Origanum vulgare</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Osteoglossum persica</i> (Burm.f.) Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Perovskia abrotanoides</i> Karel.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Phlomis abrotanoides</i> Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Phlomis herba-venii</i> L.	Wa	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Phlomis olivieri</i> Benth.	Wa	-	-	-	+	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia aegyptiaca</i> L.	Wa	-	-	-	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia atropatana</i> Bunge.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia hypoleuca</i> Benth.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia leriifolia</i> Benth.	Wa	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia limbata</i> C.A.Mey.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia macrosiphon</i> Boiss.	Wa	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia mirzayanii</i> Rech.f. & Esfand.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia multicaulis</i> Vahl.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia nemorosa</i> L.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Labiatae	<i>Salvia palaestina</i> Benth.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2. Continued

Family Name	Botanical Names	Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Labiatae	Salvia Reuterana Boiss.	Wa	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Salvia santolinifolia Boiss.	Wa	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Salvia verticillata L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Scutellaria pinnatifida A.Hamilt.	Wa	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Scutellaria Tournefortii Benth.	Wa	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Sideritis montana L.	Wa	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Stachys acerose Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Byzantina C. Koch	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Stachys inflata Benth.	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	-
Labiatae	Stachys lavandulifolia Vahl.	Wa	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	-
Labiatae	Stachys laxa Boiss. & Buhse.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Stachys pilifera Benth.	Wa	-	-	+	+	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-
Labiatae	Stachys setifera C.A.Mey. subsp. iranica (Rech.f.) Rech.f.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Stachys spectabilis Choisy ex DC.	Wa	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Teucrium orientale L. subsp. glabrescens (Hauuskn. ex Borum.) Rech.f.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labiatae	Teucrium Polium L. var. gnaphalodes Benth.	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
Labiatae	Thymus fallax Fisch. & C.A.Mey.	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
Labiatae	Thymus transcaspicus Klukov	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
Labiatae	Zataria multiflora Boiss.	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
Labiatae	Ziziphora clinopodioides Lam. subsp. rigida (Boiss.) Rech.f.	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
Labiatae	Ziziphora tenuior L.	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
Leguminosae	Acacia farnesiana (L.) Willd.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	Acacia nilotica Delile	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
Leguminosae	Alhagi persarum Boiss. & Buhse	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
Leguminosae	Argyrobolium roseum (Camb.) Jaub. & Spach	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	Astragalus adscendens Boiss & Hausskn.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	Astragalus callistachyus Boiss. et Buhse	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	Astragalus chrysostachyus Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	Astragalus dactylocarpus Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	Astragalus effusus Bunge	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	Astragalus eremophilus Emend	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	Astragalus grammocalyx Boiss. et Hohen.	Wa	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
Leguminosae	Astragalus mercklimii Boiss. & Buhse.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2. Continued

Family Name	Botanical Names	Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Leguminosae	<i>Astragalus mollis</i> Bieb.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Astragalus tribuloides</i> Delle. var. <i>thapsaceus</i> Handel	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Cicer anatolicum</i> Alef.	Wa	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Cicer oxyodon</i> Boiss. & Hohen.	Wa	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Colutea persica</i> Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Coronilla cornata</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Coronilla varia</i> L.	Wa	-	-	-	+	+	-	+	-	+	+	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Crotalaria persica</i> (Burm. f.) Merrill	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Ebenus stellata</i> Boiss.	Wa	-	-	-	+	+	-	-	+	+	+	+	+	-	-	-	-	-	-	-
Leguminosae	<i>Glycyrrhiza glabra</i> L. var. <i>glabra</i>	W	+	+	+	+	+	-	+	+	+	+	+	+	-	-	-	+	+	-	-
Leguminosae	<i>Indigofera articulata</i> Crouan.	Wa	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Indigofera intricata</i> Boiss.	Wa	-	-	-	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Lathyrus roseus</i> Stev.	Wa	-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Lotus corniculatus</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Medicago sativa</i> L.	Wa	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Melilotus officinalis</i> (L.) Pall.	Wa	-	-	-	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Onobrychis Gaubae</i> Bornm.	Wa	-	-	-	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Onobrychis ptolemaica</i> (Del.) DC.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Ononis spinosa</i> L.	Wa	-	-	-	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Pithecolobium dulce</i> Benth.	Wa	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Propolis farcta</i> (Banks & Soland.) Maobr.	Wa	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Propolis juliflora</i> (Swartz.) DC.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Sophora alopecuroides</i> L.	Wa	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Trifolium pratense</i> L.	Wa	-	-	-	+	+	-	+	-	+	+	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Trifolium repens</i> L. var. <i>macrorrhizum</i> (Boiss.) Boiss.	Wa	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Trigonella coerulea</i> (M.B.) Halacsy.	Wa	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Leguminosae	<i>Vicia peregrina</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leguminosae	<i>Vicia pseudocassubica</i> Rech. f.	Wa	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Liliaceae	<i>Asphodelus tenuifolius</i> Cav.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liliaceae	<i>Bellevallia longistyla</i> (Misez.) Grossh.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liliaceae	<i>Fremurus kopetdaghensis</i> M.Pop. ex B.Fedtsch.	Wa	+	-	-	-	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-
Liliaceae	<i>Fremurus luteus</i> Baker	Wa	-	-	-	+	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-

Table 2. Continued

Family Name	Botanical Names	Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Liliaceae	<i>Eremurus spectabilis</i> M.B.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liliaceae	<i>Fritillaria imperialis</i> L.	Wa	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liliaceae	<i>Fritillaria persica</i> L.	Wa	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liliaceae	<i>Urginea maritima</i> (L.) Baker.	Wa	-	-	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-
Linaceae	<i>Linum austriacum</i> L.	Wa	-	-	+	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-
Lythraceae	<i>Lawsonia inermis</i> L.	L	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Lythraceae	<i>Lythrum salicaria</i> L.	Wa	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malvaceae	<i>Alcea Aucheri</i> (Boiss.) Alef.	Wa	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
Malvaceae	<i>Alcea ficifolia</i> L.	Wa	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
Malvaceae	<i>Alcea kurdica</i> (Schlecht.) Alef.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malvaceae	<i>Alcea sulphurea</i> (Boiss. & Hohen.) Alef.	Wa	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Malvaceae	<i>Malva sylvestris</i> L. var. <i>mauritiana</i> (L.) Boiss.	Wa	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moraceae	<i>Ficus benghalensis</i> L.	Wa	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-
Moraceae	<i>Ficus carica</i> L. subsp. <i>rupestris</i> (Hausskn. ex Boiss.) Browicz.	Wa	-	-	-	+	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus astringens</i> Maiden.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus camaldulensis</i> Dehnh.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus dallrympleana</i> Maiden.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus fruticetorum</i> F. Muell. ex Miq.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus gillii</i> Maiden.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus lansdowniana</i> F. V. M. et S.E.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus largiflorens</i> F. Muell.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus longicornis</i> F. Muell.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus oxophleba</i> Benth.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus occidentalis</i> Endl.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus oleosa</i> F. Muell.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus rubia</i> Deane. et Maiden.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus salubris</i> F. Muell.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus sargentii</i> Maiden.	Wa	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus sideroxylon</i> A. Cunn. ex Wobbs.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Eucalyptus viridis</i> R. T. Baker.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Myrtaceae	<i>Myrtus communis</i> L.	Wa	-	-	-	+	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-
Nyctaginaceae	<i>Commicarpus stenocarpus</i> (Chiov.) Cufod.	Wa	-	-	-	+	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-
Onagraceae	<i>Epilobium minutiflorum</i> Hausskn.	Wa	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-

Table 2. Continued

Family Name	Botanical Names	Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Orobanchaceae	Cistanche eremodoxa Bornm.	Wa	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-
Orobanchaceae	Cistanche tubulosa (Schrenk) R. Wight	Wa	-	-	-	+	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-
Paeoniaceae	Paeonia wittmanniana Hartw. ex Lindl.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Papaveraceae	Glaucium contortuplicatum Boiss	Wa	-	-	-	+	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-
Papaveraceae	Glaucium elegans Fisch. & C.A.Mey.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Papaveraceae	Glaucium fimbriigerum Boiss.	Wa	-	-	-	-	+	-	-	+	+	-	-	-	+	-	-	-	-	-	-
Papaveraceae	Glaucium grandiflorum Boiss. & Huert	Wa	-	-	+	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-
Papaveraceae	Glaucium oxylebum Boiss. & Buhse	Wa	-	+	-	-	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-
Papaveraceae	Glaucium vitellinum Boiss. & Buhse	Wa	-	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-
Papaveraceae	Hypocoum pendulum L.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Papaveraceae	Papaver argemone L.	Wa	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-
Papaveraceae	Papaver bracteatum Lindl.	Wa	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Papaveraceae	Papaver dubium L.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Papaveraceae	Papaver lacerum Popov.	Wa	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Papaveraceae	Roemeria hybrida (L.) DC.	Wa	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Papaveraceae	Roemeria refracta DC.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paronychiaceae	Paronychia kurdica Boiss. var. kurdica	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paronychiaceae	Spergularia diandra (Guss.) Heldr. et Sart.	Wa	-	-	-	-	+	-	+	-	+	+	-	-	-	-	-	-	-	-	-
Plantaginaceae	Plantago lanceolata L.	Wa	-	-	-	+	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-
Plantaginaceae	Plantago major L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plantaginaceae	Plantago ovata Forssk.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plantaginaceae	Plantago psyllium L.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plumbaginaceae	Acantholimon talagonicum Boiss.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plumbaginaceae	Limonium Thouini (Viv.) O.Kuntze	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plumbaginaceae	Plumbago europaea L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polygonaceae	Polygonum aviculare L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polygonaceae	Polygonum hydropiper L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polygonaceae	Pteroporum Aucheri Jaub. & Spach	Wa	-	-	-	+	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-
Polygonaceae	Pteroporum Olivieri Jaub. & Spach	Wa	-	+	-	+	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-
Polygonaceae	Rheum Ribes L.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polygonaceae	Rumex pulcher L.	Wa	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-
Portulacaceae	Portulaca oleracea L.	Wa	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Primulaceae	Primula auriculata Lam.	Wa	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	Ranunculus aestivalis L.	Wa	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+

Table 2. Continued

Family Name	Botanical Names	Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Ranunculaceae	<i>Clematis isphahanica</i> Boiss.	Wa	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Clematis orientalis</i> L.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Consolida oliveriana</i> (DC.) Schrad.	Wa	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Consolida orientalis</i> (Gay.) Schrad.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Ranunculus arvensis</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Ranunculus brachylobus</i> Boiss. et Hohen. var. <i>major</i> Bomm.	Wa	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Ranunculus oxyspermus</i> M.B.	Wa	-	-	-	-	-	-	+	+	+	-	-	+	-	-	-	-	-	-	-
Ranunculaceae	<i>Ranunculus peltieri</i> Freyn.	Wa	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Ranunculus polyanthemus</i> L.	Wa	-	-	-	-	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Thalictrum minus</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Ochradenus baccatus</i> Delile.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Ochradenus ochrademi</i> (Boiss.) Abdallah	Wa	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
Ranunculaceae	<i>Reseda Aucheri</i> Boiss. subsp. <i>Aucheri</i>	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Reseda lutea</i> L.	Wa	+	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Paliurus spina-christi</i> Miller	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Rharnus pallasi</i> Fisch. & C.A.Mey.	Wa	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Ranunculaceae	<i>Ziziphus spina-christi</i> (L.) Willd.	L,Fr	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Rosaceae	<i>Agrimonia eupatoria</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rosaceae	<i>Amygdalus communis</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rosaceae	<i>Amygdalus eburnea</i> Spach	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rosaceae	<i>Amygdalus lycioides</i> Spach var. <i>horrida</i> (Spach) Browicz	Wa	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Rosaceae	<i>Amygdalus scoparia</i> Spach	Wa	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Rosaceae	<i>Cotoneaster nummularia</i> Fisch. & C.A.Mey.	Wa	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Rosaceae	<i>Hulthemia persica</i> (Michx. ex Juss.) Bomm.	Wa	+	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Rosaceae	<i>Rosa canina</i> L.	Wa	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
Rosaceae	<i>Rosa persica</i> Michx. ex Juss.	Wa	-	-	-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Rosaceae	<i>Sanguisorba minor</i> Scop.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Rubiaceae	<i>Callipeltis cucullaris</i> Stev.	Wa	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Rubiaceae	<i>Cruciate taurica</i> (Pallas & Willd.) Ehrend.	Wa	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-
Rubiaceae	<i>Gahum coronatum</i> Sibth. et Sm.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Rubiaceae	<i>Gahum humifusum</i> Bieb.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubiaceae	<i>Gahum verum</i> L.	Wa	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Rubiaceae	<i>Phuopsis stylosa</i> (Trin.) Hook. f.	Wa	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rubiaceae	<i>Rubia florida</i> Boiss.	Wa	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-

Table 2. Continued

Family Name	Botanical Names	Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Rubiaceae	<i>Rubia tinctorum</i> L.	W	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rutaceae	<i>Citrus aurantifolia</i> Swingle	Wa	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-
Rutaceae	<i>Citrus aurantium</i> Rissa.	Wa	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rutaceae	<i>Citrus bigardia</i> Loisel.	Wa	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rutaceae	<i>Haplophyllum perforatum</i> (M.B.) Kar. & Kir.	Wa	-	-	-	+	-	-	-	+	+	+	+	-	+	-	-	-	-	-	-
Rutaceae	<i>Haplophyllum robustum</i> Bge.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sapindaceae	<i>Dodonaea viscosa</i> (L.) Jacq.	Wa	-	+	-	+	+	+	-	+	+	+	+	-	-	-	-	-	-	-	-
Sapindaceae	<i>Stocksia brahuica</i> Benth.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Bungea trifida</i> (Vahl) C.A.Mey.	Wa	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Linaria longipes</i> Boiss. et Heldr.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Rhynchosorys elephas</i> (L.) Griseb.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Scrophularia crenophila</i> Boiss.	Wa	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Scrophularia deserti</i> Del.	Wa	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Scrophularia nervosa</i> Benth. subsp. Boissierana (Jaub. & Spach) Grau	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Scrophularia striata</i> Boiss.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Verbascum cheiranthifolium</i> Boiss.	Wa	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Verbascum erianthum</i> Benth. in DC.	Wa	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	-	-
Scrophulariaceae	<i>Verbascum farsitanicum</i> (Murh.) Hub.-Mor.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Verbascum speciosum</i> Schrad.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scrophulariaceae	<i>Veronica arvensis</i> L.	Wa	+	-	-	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-
Solanaceae	<i>Datura innoxia</i> Miller	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solanaceae	<i>Datura stramonium</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solanaceae	<i>Hyoscyamus niger</i> L.	Wa	-	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
Solanaceae	<i>Hyoscyamus reticulatus</i> L.	Wa	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
Solanaceae	<i>Lycium depressum</i> Stocks subsp. depressum	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solanaceae	<i>Lycium ruthenicum</i> Murray	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solanaceae	<i>Lycium shawii</i> Roemer et Schultes	Wa	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-
Solanaceae	<i>Solanum incanum</i> L.	Wa	-	-	-	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-
Solanaceae	<i>Solanum nigrum</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solanaceae	<i>Solanum perisperm</i> Willd. ex Schultes	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tamaricaceae	<i>Reaumuria cistoides</i> Adam.	Wa	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tamaricaceae	<i>Reaumuria squarrosa</i> Jaub. & Spach	Wa	-	-	-	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	+
Tamaricaceae	<i>Tamarix ramosissima</i> Ledeb.	Wa	-	-	-	+	-	-	+	+	+	+	+	-	-	-	-	-	-	-	+



Table 2. Continued

Family Name	Botanical Names	Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Thymelaeaceae	Daphne mucronata Royle	Wa	-	-	-	-	-	-	+	-	+	+	+	-	-	-	-	-	-	-	-
Thymelaeaceae	Daphne oleoides Schreb.	Wa	-	-	-	-	+	-	+	-	+	+	-	-	-	-	-	-	-	-	-
Thymelaeaceae	Daphne oleoides Schreb. var. kurdica Bornm.	Wa	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thymelaeaceae	Dendrostepera lessertii (Wikstr.) Van Tiegh.	Wa	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Typhaceae	Arum elongatum Stev.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Typhaceae	Typha latifolia L.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ulmaceae	Celtis caucasica Willd.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Anethum graveolens L.	Wa	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Umbelliferae	Artemisia squamata L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Bunium cyandricum (Boiss. & Hohen.) Drude	Wa	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Umbelliferae	Bupleurum faicatum L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Daucus carota L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Daucosia anethifolia (DC.) Boiss.	Wa	-	-	-	+	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-
Umbelliferae	Echinophora platyloba DC.	Wa	-	-	-	+	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-
Umbelliferae	Eryngium Bungei Boiss.	Wa	-	-	-	+	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-
Umbelliferae	Eryngium thyrsoideum Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Ferula gumosa Boiss	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Ferulago angulata (Schlecht.) Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Foeniculum vulgare Miller	Wa	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Umbelliferae	Heraclium persicum Desf. ex Fischer.	Fr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Umbelliferae	Pimpinella anisum L.	Wa	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Umbelliferae	Pimpinella aurea DC.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Pimpinella kotschyana Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Pimpinella puberula (DC.) Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Prangos cheilanthifolia Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Prangos ferulacea (L.) Lindl.	Wa	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Umbelliferae	Prangos uloptera DC.	Wa	-	-	-	+	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-
Umbelliferae	Psarriogeton canescens (DC.) Vatke.	Wa	-	-	-	+	-	-	+	-	+	+	+	+	+	+	+	+	+	+	+
Umbelliferae	Pycnocycla spinosa Decne. ex Boiss.	Wa	-	-	-	-	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-
Umbelliferae	Scandix stellata Banks & Soland.	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Seseli peucedanoides (M.B.) Kos.-Pol	Wa	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Smyrniopsis Aucheri Boiss.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Umbelliferae	Tortilis arvensis (Huds.) Link	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2. Continued

Family Name	Botanical Names	Part	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Umbelliferae	<i>Turgenia latifolia</i> (L.) Hoffm.	Fl,Fr	-	-	-	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-
Urticaceae	<i>Panetaria judaica</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Urticaceae	<i>Urtica dioica</i> L.	Wa	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Verbenaceae	<i>Verbena officinalis</i> L.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Violaceae	<i>Viola odorata</i> L.	Wa	+	-	+	+	+	-	+	+	-	-	+	+	+	+	+	+	+	-	-
Zygophyllaceae	<i>Fagonia indica</i> Burm. var. <i>Schwemfurtherii</i> Hadidi.	Wa	-	-	-	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-
Zygophyllaceae	<i>Peganum Harmala</i> L.	Wa	-	-	-	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-
Zygophyllaceae	<i>Tribulus terrestris</i> L.	Wa	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
Zygophyllaceae	<i>Zygophyllum atriplicoides</i> Fisch. & C.A.Mey	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zygophyllaceae	<i>Zygophyllum eurypterum</i> Boiss. & Buhse.	Wa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zygophyllaceae	<i>Zygophyllum fabago</i> L. subsp. <i>orientale</i> Boriss. ex Hadidi.	Wa	-	-	-	+	+	-	+	+	-	-	+	-	-	-	-	-	-	-	-
Zygophyllaceae	<i>Zygophyllum propinquum</i> Deene.	Wa	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Number of (+)		20	22	6	125	78	19	67	65	79	56	91	9	7	2	16	8	9	1	1
	Blank		22	57	182	32	97	255	121	130	97	138	115	225	221	243	102	242	224	241	242
	Number of (-)		240	203	94	125	107	8	94	87	106	88	76	48	54	37	164	32	49	40	39
	Sum		282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282

35 °C after 72-168 hr of incubation. The antifungal activity of the extracts were expressed by two symbols as "-" (no effect), and "+" (complete growth inhibition)(8). For dermatophytes strains, Grisofulvin and for the rest of the strains Amphotericin B, were used as positive control and as negative control methanol was used in the antifungal assay (9).

#### Microorganisms

The used strains are shown in Table 1. All strains were isolated from local patients and were identified and classified by the medical mycologists in the School of Public Health of Tehran University of Medical Sciences. The strains were recultured and used for this study.

### RESULT AND DISCUSSION

Scientific name of the identified plant species and the results of their antifungal activity are listed in Table 2 and have arranged alphabetically according to their botanical names of plant families. As shown in Table 2, of the 278 extracts of Iranian native species belonging to 37 plant families, 201 extracts have antifungal effects against one or more fungal strains.

The most effective plants were: *Mentha longifolia*, *Salvia multicaulis*, *Thymus transcaspicus*, *Zataria multiflora*, *Glycyrrhiza glabra*, *Hulthemia persica*, *Heracleum persicum*, *Pimpinella anisum*, *Pragnos ferulacea*, *Pragnos uloptera*, and *Viola odorata*

that exhibit activity against at least 50% of fungal strains. The most sensitive fungal strains were: *Trichophyton violaceum* (70.3%), *Epidermophyton floccosum* (54.49%), *Microsporum canis* (50%), *Trichophyton schoenleinii* (42.76%), *Trichophyton mentagrophytes* (42.70%), *Microsporum gypseum* (42.16%), *Trichophyton verrucosum* (41.61%) and *Trichophyton rubrum* (38.88%).

Of all the plants investigated, the *Leguminosae* family with 34 active species (82.92%) was highly ranked. The second and third most effective families were, *Labiatae* and *Umbelliferae*, which exhibited 42 (76.36%) and 19 (67.85%) bioactive members, respectively.

Reviewing the literature (9-15) revealed that, the noticeable species of this investigation have not been reported previously. These worth attending results are due to specific geobotanical and climatical conditions of Iran that may facilitate production of active substances in comparison with the same species growing wild in the other lands. We wish these results may provide a basis for the isolation of active compounds from these medicinal plants.

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