Iranian Medicinal Plants: From Ethnomedicine to Actual Studies

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Received: 9 January 2020; Accepted: 21 February 2020; Published: 26 February 2020

Abstract: Iran has a rich and diverse cultural heritage, consisting of a complex traditional medicine deeply rooted in the history of the territory that goes back to the Assyrian and Babylonian civilizations. The ethnomedical practices that can be identifiable nowadays derive from the experience of local people who have developed remedies against a wide range of diseases handing down the knowledge from generation to generation over the millennia. Traditional medicine practices represent an important source of inspiration in the process of the development of new drugs and therapeutic strategies. In this context, it is useful to determine the state of the art of ethnomedical studies, concerning the Iranian territory, and of scientific studies on plants used in traditional Iranian medicine. Data regarding 245 plants used in Iranian ethnomedical practices and scientific studies conducted on 89 plants collected in the Iranian territory have been reported. All of the scientific studies here reported draw inspiration from traditional medicine. The World Health Organization (WHO) has repeatedly called for an intensification of the scientific validation processes of traditional medicines intended as an important contribution to public health in various parts of the world. The process of study and validation of Iranian ethnomedical practices appears to be at an early stage.

Keywords: Iranian traditional medicine; biological activities; pharmaceutical; cosmeceutical; nutriceutical

1. Introduction

Traditional medicine practices represent an important and often underestimated part of healthcare around the world. Moreover, traditional knowledge is a source of inspiration for researches on biological activities of vegetal extracts and pure compounds that can be obtained from them. A great number of lifesaving therapeutic assets belonging to modern medicine and new active compounds are derived from traditional knowledge and traditional uses of plants.

The awareness of this fact led to the drawing up of the World Health Assembly (WHA) resolution on Traditional Medicine (WHA62.13) and the WHO Traditional Medicine Strategy 2002–2005 and 2014–2023. These documents aim to integrate at the international level national healthcare systems with traditional knowledge and practices through an assessment of safety, efficacy, and quality of the treatments. In order to achieve these objectives, it is necessary to properly carry out
scientific researches; the biological activities of the plants used must be tested, and the effectiveness of the treatments both “in vitro” and “in vivo” must be assessed considering the risk/benefit profile. Thus, one of the main raised issues—related to the use of traditional practices in national policies and regulations—is the lack of research data [1].

WHO defines traditional medicine as follows: “Traditional medicine has a long history. It is the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness” [2].

In light of a literature search, the traditional Iranian medicine (also known as Persian medicine) results, particularly rich in information, which can justify new studies regarding the therapeutic use of plants and vegetal extracts; it consists of the totality of the knowledge passed down through the generations and of the practices based entirely on observations and practical experience used, from ancient times to nowadays, in diagnosis, prevention, and elimination of diseases in the Iranian territory [3].

In this context, it was of great interest for us to collect scientific reports/studies, deriving from traditional practices, regarding health properties: biological activities of native Iranian plants proper to the medicinal, dermo-cosmetic, and nutriceutical use, in order to provide a complete overview of the scientific knowledge and establish a starting point for further research. Particular attention was paid to works that open up research possibilities on new therapeutic assets that deserve a follow-up to determine the efficacy of the reported biological activities in vivo.

2. Materials and Methods

The Present Review Was Performed Adopting The Following Databases: Scifinder, Pubmed, Google Scholar

Selection criteria were defined, including articles regarding ethnobotanical studies on medicinal plants traditionally used in the Iranian territory and articles reporting scientific studies on plants grown and collected in Iran, including biological activities that can be spent in the pharmaceutical, cosmetic/cosmeceutical, nutraceutical fields. Particular attention was paid to works that may open up research paths to new therapeutic assets. All the studies reported in this review draw inspiration from Iranian traditional medicine practices.

The following keywords were selected: “Iran plants”, “Iranian medicinal plants”, “Iranian plants biological activities”. Only articles in the English language were selected, and data from patents, symposiums, and congress abstracts were excluded because not enough complete to warrant an effective comparison with full papers. Papers that did not show a clear botanical identification were rejected. The database www.theplantlist.org was used to check the correctness of the nomenclature of the reported plant species.

3. Results and discussion

3.1. Medicinal Plants Traditionally Used in Iran

Iran has a history of great importance in the field of traditional medicine practices; this knowledge heritage goes back to the time of Babylonian-Assyrian civilization; every generation added his experience and new elements to this “cultural database”. Nowadays, medicinal plants are still used in Iran as curatives for various types of health problems [4]. A great part of this traditional knowledge has not been considered by the scientific point of view yet, and it would be advisable to check the effectiveness of the traditional treatments, especially when there are no supporting data in the scientific literature.

A bibliographic search was performed, selecting ethnobotanical studies conducted through questionnaires and personal interviews with traditional healers and local people in the Iranian territory that include clear botanical identification of the plants, traditional uses, and type of administration.
Table 1 collects reports of plants used for medicinal purposes in the Iranian territory, their local name, the part of the plant used, type of extraction/preparation, the territory where the plant use is reported.
Table 1. Plants traditionally used as medicinal remedies in the Iranian territory. Local name, part of the plant used, type of extraction/preparation, the area where the use of the plant is reported. (N.r. = not reported).

| Scientific Name | Family       | Local Name | Part Used | Type of Extract | Medicinal Uses | Area                                      | Author(s)                                      |
|-----------------|--------------|------------|-----------|-----------------|----------------|-------------------------------------------|-----------------------------------------------|
| 1. *Abelmoschus esculentus* (L.) Moench | Malvaceae    | Bamieh     | Seed      | n.r.            | Anti-inflammatory, Diuretic, Laxative | Mashhad city, Northeastern Iran               | [5] Amiri and Joharchi 2013                      |
| 2. *Acanthophyllum sordidum* Bunge ex Boiss. | Caryophylaceae | Choobak    | Root      | n.r.            | Warts, Washing | Mashhad city, Northeastern Iran               | [5] Amiri and Joharchi 2013                      |
| 3. *Acanthophyllum* spp. | Caryophylaceae | Chobak     | Aerial parts | Herbal tea/decocction | Antiparasitic | Shiraz, Fars province                                      | [6] Bahmani et al. 2016                      |
| 4. *Achillea millefolium* L. | Asteraceae    | n.r.       | Inflorescence | Boiled, steamed | Antidiabetic | Urmia county, Northwest Iran                 | [7] Bahmani et al. 2014                        |
| 5. *Achillea millefolium* L. | Asteraceae    | Boomadaran | Aerial parts | Herbal tea/decocction | Antiparasitic | Shiraz, Fars province                                      | [6] Bahmani et al. 2016                        |
| 6. *Achillea santolinoides subsp. wilhelmsii* (K. Koch) Gruter | Asteraceae    | Bumadaran  | Aerial parts | n.r.            | Anti-hemorrhoids, Antidiarrhea, Hypoglycemic, Anthelmintic, Mastitis, Antacid, Dyspepsia, Nerve Tonic, Treatment of Osteoarthritis, Treatment of Blood Flooding, Appetizer | Mashhad city, Northeastern Iran               | [5] Amiri and Joharchi 2013                      |
| 7. *Adiantum capillus-veneris* L. | Pteridaceae   | Parsiavashan | Aerial parts | n.r.            | Antitussive, Anti-hemorrhoid, Treatment of Sore Throat, Febrifuge, Jaundice, Laxative, Anti-thirst, | Mashhad city, Northeastern Iran               | [5] Amiri and Joharchi 2013                      |
| No. | Species                          | Family          | Part(s)         | Type             | Conditions                                      | Location                              | Reference                      |
|-----|---------------------------------|-----------------|-----------------|------------------|------------------------------------------------|---------------------------------------|---------------------------------|
| 7.  | *Alcea spp.*                    | Malvaceae       | Flower          | n.r.             | Antitussive, Febrifuge, Treatment of Pimples, Laxative, Depurative, Treatment of Gum Swelling | Mashhad city, Northeaster n Iran     | [5] Amiri and Joharchi 2013     |
| 8.  | *Alhagi graecorum* Boiss.        | Fabaceae        | Manna           | n.r.             | Jaundice, Laxative, Febrifuge, Thirst, Aphthous Ulcers | Mashhad city, Northeaster n Iran     | [5] Amiri and Joharchi 2013     |
| 9.  | *Alhagi maurorum* Medik.         | Fabaceae        | Aerial parts - Manna | n.r.          | Appetite Supressant, Diuretic, Jaundice, Febrifuge | Mashhad city, Northeaster n Iran     | [5] Amiri and Joharchi 2013     |
| 10. | *Allium altissimum* Regel        | Amaryllidaceae  | Bulb            | n.r.             | Antiseptic, Appetizer, Digestive                  | Mashhad city, Northeaster n Iran     | [5] Amiri and Joharchi 2013     |
| 11. | *Allium cepa*                    | Amaryllidaceae  | Bulb            | Herbal tea/decocition | Antiparasitic, Treatment of Trichodplosis          | Shiraz, Fars province                | [6] Bahmani et al. 2016         |
| 12. | *Allium haementhoides* Bioss. & Ruet. Ex Regel | Liliaceae | Leaf, flower stem | Brew              | Peptic Ulcer                                      | Lorestan province                   | [8] Delfan et al. 2015          |
| 13. | *Allium sativum* L.              | Amaryllidaceae  | Bulb            | n.r.             | Hypoglycemic, Cardiac Diseases, Antiseptic, Toothache, Antihyperlipidemia, Anthelmintic, Antihypertensive | Mashhad city, Northeaster n Iran     | [5] Amiri and Joharchi 2013     |
| 14. | *Althaea officinalis* L.         | Malvaceae       | Charme giah     | Root              | Mouth Wounds, Bone Fracture, Treatment of Bruises, Treatment of Dysuria | Mashhad city, Northeaster n Iran     | [5] Amiri and Joharchi 2013     |
|   | Species and Common Names | Family | Place of Collection | Part Used | Preparation/Use | Region | Reference |
|---|--------------------------|--------|---------------------|-----------|----------------|--------|-----------|
| 15. | *Alyssum alyssoides* (L.) L. | Brassicaceae | Ghodumeh | Seed | n.r. | Pharyngitis, Antitussive, Febrifuge, Laxative, Treatment of Hoarseness | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 16. | *Alyssum desertorum* Stapf. | Brassicaceae | n.r. | Seed | Boiled, herbal fumigation | Antidiabetic | Urmia county, Northwest Iran | [7] Bahmani et al. 2014 |
| 17. | *Amaranthus caudatus* L. | Amaranthaceae | Taj Khorus | Aerial parts | n.r. | Disinfectant Treatment of Entertis, Febrifuge, Antitussive, Antidiarrhea, Laxative | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 18. | *Amygdalus communis* | Rosaceae | Badam-e shirin | Green fruit and seed | Boiled, brewed, raw | Anti-hair Loss | Khiregah-e Jangali, Ghasemloo | [9] Baharvand-Ahmadi et al. 2015 |
|   | *Amygdalus communis* | Rosaceae | Baadam | Fruit | Herbal tea/decoction | Antiparasitic | Shiraz, Fars province | [6] Bahmani et al. 2016 |
| 19. | *Anacamptis morio* (L.) R. M. Bateman | Orchidaceae | Saalab gholveh | Root | n.r. | Tonic | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 20. | *Anastatica hierochuntica* L. | Brassicaceae | Change mayam | Aerial parts | n.r. | Bring Luck to Pregnant Women, Menstrual Regulator | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 21. | *Anchusa italica* | Boraginaceae | Gole-gazou | Leaf, flower | Decoction | Stomach Ache | Lorestan province | [8] Delfan et al. 2015 |
| 22. | *Anethum graveolens* L | Apiaceae | Shevid | Fruit | n.r. | Abortion, Anti-dysmenorrhea, Galactagogue, Antihyperlipidemia, Carminative | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 23. | *Anthemis tinctoria* L. | Asteraceae | Baboone-ye zard | Flowering shoot | Boiled, brewed, paste | Beauty and Clarity of the Skin, Strengthening of Hair Roots | Khiregah-e Jangali, Ghasemloo valley | [9] Baharvand-Ahmadi et al. 2015 |
| No. | Plant Name | Family | Origin | Part Used | Preparation | Medicinal Use | City, Region | Reference(s) |
|-----|------------|--------|--------|-----------|-------------|--------------|--------------|--------------|
| 24. | *Apium graveolens* L. | Apiaceae | Karafs | Fruit | n.r. | Emmenagogue, Diuretic, Carminative | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 25. | *Arctium lappa* L. | Asteraceae | Baba Adam | Leaves - Root | n.r. | Diuretic, Cholagogue, Depurative, Hypoglycemic, Antidiabetic | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 26. | *Arnebia euchroma* (Royle) I.M.Johnst. | Boraginaceae | Havachoobeh | Root | n.r. | Treatment of Dermal Disorders, Hair Tonic | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 27. | *Artemisia absinthium* | Asteraceae | Ofsantin | Leaf | Herbal tea/decoction | Antiparasitic, Anthelmintic, Appetizer, Indigestion | Shiraz, Fars province | [6] Bahmani et al. 2016 |
| 28. | *Artemisia dracunculus* L. | Asteraceae | Tarkhun | Leaves | n.r. | Appetizer, Dyspepsia, Antacid, Carminative | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 29. | *Artemisia sieberi* Besser | Asteraceae | Dermaneh | Flowering shoot | Boiled, brewed, paste | Baldness | Khiregah-e Jangali, Ghasemloo valley | [9] Baharvand-Ahmadi et al. 2015 |
| 30. | *Artemisia vulgaris* L. | Asteraceae | Baranjasef | Flower | n.r. | Nerve Tonic, Sexual Impotency, Menstrual Regulator | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 31. | *Arundo donax* L. | Poaceae | Tabashir ghalam | Latex | n.r. | Aphthous Ulcer, Anti Thirst, Depurative, Treatment of Pimples, Febrifuge | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| No. | Species                                                                 | Family     | Part(s)                | Source           | Additional Notes                  |
|-----|------------------------------------------------------------------------|------------|------------------------|------------------|-----------------------------------|
| 32  | *Astragalus adscendens* Boiss. & Hausskn. ex Boiss.                   | Fabaceae   | Gazangabin             | Manna            | Laxative, Febrifuge               |
|     |                                                                        |            |                        | n.r.             | Digestive                         |
|     |                                                                        |            |                        | Mashhad city,    | Northeaster n Iran                |
|     |                                                                        |            |                        | [5] Amiri and    | Joharchi 2013                     |
|     |                                                                        |            |                        |                  |                                   |
| 33  | *Astragalus fasciculifolius* subsp. *arbusculinus* (Bornm. & Gauba) Tietz | Fabaceae   | Anzerut                | Gum              | Antitussive, Jaundice, Laxative,  |
|     |                                                                        |            |                        | n.r.             | Anthelmintic                      |
|     |                                                                        |            |                        | Mashhad city,    | Northeaster n Iran                |
|     |                                                                        |            |                        | [5] Amiri and    | Joharchi 2013                     |
|     |                                                                        |            |                        |                  |                                   |
| 34  | *Astragalus hamosus* L.                                               | Fabaceae   | Nakhonak               | Fruit            | Anodyne, Repel of Kidney Stone,   |
|     |                                                                        |            |                        | n.r.             | Diuretic, Arthrodynia, Carminative|
|     |                                                                        |            |                        | Mashhad city,    | Northeaster n Iran                |
|     |                                                                        |            |                        | [5] Amiri and    | Joharchi 2013                     |
|     |                                                                        |            |                        |                  |                                   |
| 35  | *Astragalus sieversianus* Pall.                                       | Fabaceae   | Gol Sefid              | Fruit            | Menstrual Disorders               |
|     |                                                                        |            |                        | n.r.             | Mashhad city, Northeaster n Iran  |
|     |                                                                        |            |                        | [5] Amiri and    | Joharchi 2013                     |
|     |                                                                        |            |                        |                  |                                   |
| 36  | *Astragalus spp.*                                                     | Fabaceae   | Katira                 | Gum              | Mouth Wounds, Aphrodisiac,        |
|     |                                                                        |            |                        | n.r.             | Cystitis, Hair Tonic              |
|     |                                                                        |            |                        | Mashhad city,    | Northeaster n Iran                |
|     |                                                                        |            |                        | [5] Amiri and    | Joharchi 2013                     |
|     |                                                                        |            |                        |                  |                                   |
| 37  | *Atropa belladonna* L.                                                | Solanaceae | Beladon                | Leaves           | Antispasmodic, Sedative           |
|     |                                                                        |            |                        | n.r.             | Mashhad city, Northeaster n Iran  |
|     |                                                                        |            |                        | [5] Amiri and    | Joharchi 2013                     |
|     |                                                                        |            |                        |                  |                                   |
| 38  | *Avena sativa* L.                                                     | Poaceae    | Jo dosar               | Seed             | Treatment of Acne                 |
|     |                                                                        |            |                        | n.r.             | Mashhad city, Northeaster n Iran  |
|     |                                                                        |            |                        | [5] Amiri and    | Joharchi 2013                     |
|     |                                                                        |            |                        |                  |                                   |
| 39  | *Berberis integerima* Bunge.                                          | Berberidaceae | n.r.               | Fruit, leaf,    | Antidiabetic, Hypoglycemic,       |
|     |                                                                        |            |                        | skin,            | Antihypertensive, Blood and Liver |
|     |                                                                        |            |                        | Boiled, steamed  | Cleanser, Jaundice, Febrifuge,    |
|     |                                                                        |            |                        |                  | Antigout                          |
|     |                                                                        |            |                        |                  | Mashhad city,                      |
|     |                                                                        |            |                        |                  | Urmia county, Northwest Iran      |
|     |                                                                        |            |                        |                  | Bahmani et al. 2014               |
|     | *Berberis integerima* Bunge                                           | Berberidaceae | Zereshk Kuhi | Fruit |                             |
|     |                                                                        |            |                        | n.r.             |                                 |
|     |                                                                        |            |                        |                  |                                    |
|     |                                                                        |            |                        |                  |                                    |
| No. | Plant Name                  | Family     | Part     | Preparation | Uses                                      | Location                  | References                  |
|-----|----------------------------|------------|----------|-------------|-------------------------------------------|---------------------------|-----------------------------|
| 40  | *Berberis sp.*             | Berberidaceae | Fruit    | n.r.        | Antigout, Blood and Liver Cleanser, Febrifuge, Anthelmintic, Treatment of Dysentery | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 41  | *Borago officinalis*       | Boraginaceae | Flower   | Herbal tea/decocction | Antiparasitic | Shiraz, Fars province | [6] Bahmani et al. 2016 |
| 42  | *Brassica napus*           | Brassicaceae | Leaf     | Decoction   | Stomach Ache                              | Lorestan province         | [8] Delfan et al. 2015     |
|     | *Brassica napus* L.        | Brassicaceae | Seed     | n.r.        | Antiseptic, Treatment of Cold, Tonic      | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 43  | *Brassica nigra* (L.) K.Koch | Brassicaceae | Seed     | n.r.        | Laxative                                  | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 44  | *Bunium cylindricum* (Boiss. & Hohen.) Drude | Apiaceae | Zireh Siah | Fruit | n.r. | Carminative | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 45  | *Bunium persicum* (Boiss.) B. Fedtsch. | Apiaceae | Zireh Siah | Fruit | n.r. | Obesity, Galactogogue, Flavoring, Carminative, Calmative, Appetizer, Indigestion | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 46  | *Caccinia macranthera* (Banks & Sol.) Brand | Boraginaceae | Gavzaban sabz | Aerial parts | n.r. | Sedative, Treatment of Cough, Expectorant | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 47  | *Camellia sinensis* (L.) Kuntze | Theaceae | Chai Sabz | Leaves | n.r. | Obesity, Anticancer, Antihypertensive, Hepatitis, Antihyperlipidemia | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| No. | Species                               | Family      | Part(s)       | Use(s)                                | Location                        | Reference       |
|-----|---------------------------------------|-------------|---------------|---------------------------------------|---------------------------------|-----------------|
| 48  | Cannabis sativa L.                     | Cannabinaceae | Seed          | Sedative, Tonic Treatment of Osteoarthritis, Treatment of Ear Pain | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 49  | Capparis spinosa L.                    | Capparaceae  | Kavar Fruit-Root | Liver Tonic, Hepatitis, Appetizer, Anthelmintic, Stomach Tonic, Emmenagogue, Antigout | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 50  | Capsella bursa-pastoris (L.) Medik.    | Brassicaceae | Kiseh Keshish Seed | Period Regulator, Anti-hemorrhage, Antidiarrhea | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 51  | Capsicum annuum L.                     | Solanaceae   | Feifel Ghermez Fruit | Appetizer, Spice, Treatment of Osteoarthritis, Tonic, Stimulant, Aphrodisiac | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 52  | Carthamus tinctorius L.                | Asteraceae   | Golrang (Kajireh) Flower - Seed | Emmenagogue, Flavoring Luxative, Treatment of Rheumatism | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 53  | Centaurea behen L.                     | Asteraceae   | Bahman Sefid Root | Aphrodisiac, Anti-lithiasis | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 54  | Centaurea depressa M. Bieb.            | Asteraceae   | Gole Gandom Aerial parts | Digestive, Febrifuge, Cholagogue, Blood Cleanser, Antigout | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 55  | Cerasus avium (L.) Moench              | Rosaceae     | Dome Gilas Pedicel | Anti-lithiasis, Prostate Disorders Kidney Stone, Anti-inflammatory | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 56  | Cerasus microcarpa                     | Rosaceae     | n.r. Fruit     | Boiled, raw use Blood Refining | Urmia county, Northwest Iran | Bahmani et al. 2014 |
| No. | Plant Name                       | Family          | Place          | Part(s)                  | Treatment/Use                                      | Reference                                      |
|-----|---------------------------------|-----------------|----------------|--------------------------|---------------------------------------------------|------------------------------------------------|
| 57. | Ceterach officinalis             | Phillicineae    | Saraks         | Aerial parts             | Paste                                             | Khiregah-e Jangali, Ghasemloo valley            | [9] Baharvand-Ahmadi et al. 2015 |
|     |                                 |                 |                |                          | Head Itching                                      |                                                 |                                  |
| 58. | Cichorium intybus L.             | Asteraceae      | Kasni          | Root, leaves, flower, and seeds | n.r.                                              | Treatment of Pulpitation, Appetizer, Depurative, Treatment of Furuncles, Jaundice, Febrifuge, Anti-allergic | [5] Amiri and Joharchi 2013 |
|     | Cichorium intybus L.             | Asteraceae      | Kasni          | Boiled                   |                                                   | Mashhad city, Northeaster n Iran                | [9] Baharvand-Ahmadi et al. 2015 |
| 59. | Cinnamomum verum                 | Lauraceae       | n.r.           | Skin                     | Boiled                                           | Antidiabetic                                    | [7] Bahmani et al. 2014 |
|     | Cinnamomum verum                 | Lauraceae       | Darchin        | Fruit shells             | Herbal tea/decoction                              | Antiparasitic                                   | [6] Bahmani et al. 2016 |
| 60. | Citrullus colocynthis (L.) Schrad. | Cucurbitaceae   | n.r.           | Fruit                    | Boiled                                           | Antidiabetic                                    | [7] Bahmani et al. 2014 |
|     | Citrullus colocynthis (L.) Schrad. | Cucurbitaceae   | Hanzal         | Fruit-Seed               |                                                   | Purgative, Anodyne, Hypoglycemic                 | [5] Amiri and Joharchi 2013 |
|     |                                 |                 |                |                          |                                                   | Mashhad city, Northeaster n Iran                |                                                 |
| 61. | Citrus aurantiifolia (Christm.) Swingle | Rutaceae   | Limu Amani     | Fruit                    | n.r.                                              | Antihypertensive, Calmative                      | [5] Amiri and Joharchi 2013 |
| 62. | Citrus aurantium L.              | Rutaceae        | Bahar Naranj    | Flower                   | n.r.                                              | Anti-stress, Cardiac Tonic, Food Digestion, Antihypertensive | [5] Amiri and Joharchi 2013 |
| 63. | Clinopodium graveolens (M. Bieb.) Kuntze | Lamiaceae  | Faranjmeshk    | Seed                     | n.r.                                              | Pharyngitis, Gastric Ulcer, Nerve Tonic         | [5] Amiri and Joharchi 2013 |
|     |                                 |                 |                |                          |                                                   | Mashhad city,                                   |                                                 |
| No. | Species                          | Family          | Part(s)   | Form   | Uses                                    | Region                                      | Reference                                      |
|-----|---------------------------------|-----------------|-----------|--------|-----------------------------------------|---------------------------------------------|------------------------------------------------|
| 64. | *Colchicum autumnale* L.        | Colchicaceae    | Root      | n.r.   | Antigout, Calmative, Arthrodynia         | Mashhad city, Northeaster n Iran            | [5] Amiri and Joharchi 2013                      |
| 65. | *Colchicum kotschyi* Boiss.     | Liliaceae       | Gol-e hasrat | Flower | Paste                                   | Khiregah-e Jangali, Ghasemloo valley        | [9] Baharvand-Ahmadi et al. 2015                  |
| 66. | *Conium maculatum* L.          | Apiaceae        | Shokaran   | Root   | Cholagogue, Depilator, Treatment of Dermal Allergies | Mashhad city, Northeaster n Iran            | [5] Amiri and Joharchi 2013                      |
| 67. | *Convolvulus arvensis* L.       | Convolvulaceae  | Pichak-e sabrae | Aerial parts | Paste                                   | Khiregah-e Jangali, Ghasemloo valley        | [9] Baharvand-Ahmadi et al. 2015                  |
| 68. | *Cordia myxa* L.               | Boraginaceae    | Sepestan   | Fruit  | Pharyngitis, Antitussive, Febrifuge, Laxative | Mashhad city, Northeaster n Iran            | [5] Amiri and Joharchi 2013                      |
| 69. | *Coriandrum sativum* L.        | Apiaceae        | Geshniz    | Fruit  | Acne, Treatment of Flatulence, Appetizer, Aphrodisiac, Calmative, Jaundice, Antiseptic, Aromatic | Mashhad city, Northeaster n Iran            | [5] Amiri and Joharchi 2013                      |
| 70. | *Cornus mas* L.                | Cornaceae       | Zoghal Akhteh | Fruit  | Prostatic Hypertrophy, Anti-hemorrhage, Antidiarrhea, Febrifuge | Mashhad city, Northeaster n Iran            | [5] Amiri and Joharchi 2013                      |
| 71. | *Coronilla varia* L.           | Fabaceae        | n.r.       | Leaf   | Raw use, boiled                          | Urmia county, Northwest Iran                | [7] Bahmani et al. 2014                           |
| 72. | *Corylus avellana* L.          | Betulaceae      | Fandogh    | Fruit  | Treatment of Anemia                      | Mashhad city                                | [5]                                             |
| 73. | Crataegus aronia (L.) Bosc ex Dc. | Rosaceae | n.r. | Fruit and skin | Raw use, boiled | Antidiabetic | Urmia county, Northwest Iran | Bahmani et al. 2014 |
| 74. | Crataegus oxycaantha L. | Rosaceae | n.r. | Fruit, flower root, skin | Raw use, boiled | Antidiabetic | Urmia county, Northwest Iran | Bahmani et al. 2014 |
| 75. | Crataegus sp. | Rosaceae | Sorkhe Valik | Fruit-Leaves | n.r. | Depurative, Repairs Blood Vessel | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 76. | Crocus sativus L. | Iridaceae | Zaffaron | Style | n.r. | Tonic, Dysmenorrheal, Emmenagogue, Nerve Tonic, Premature Ejaculation, Gastric Ulcer, Aphrodisiac | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 77. | Cucumis sativus L. | Cucurbitaceae | Khiar | Seed | n.r. | Diuretic, Antilithiasis, Blood Cleansing, Febrifuge | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 78. | Cuminum cyminum L. | Apiaceae | Zireh Sabz (Keravieh) | Fruit | n.r. | Treatment of Colic, Galactogogue, Obesity, Digestive, Flavoring, Antiseptic | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 79. | Cuscuta epithymum Murray | Convolvulaceae | Aftimun | Aerial parts | n.r. | Laxative, Antihemorrhoids | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 80. | Cydonia oblonga Mill. | Rosaceae | Beh Daneh | Seed-Leaves | n.r. | Cardiac Diseases, Antitussive, Sore Throat, Laxative, Febrifuge | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 81. | Cyperus rotundus L. | Cyperaceae | Soade Kufi | Root | n.r. | Strengthening of Memory | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| No. | Plant Name | Family | Part Used | Source | Treatment | Location | Reference |
|-----|------------|--------|-----------|--------|-----------|----------|-----------|
| 82. | *Dactylorhiza umbrosa* (Kar. & Kir.) Nevski | Orchidaceae | Root | n.r. | Treatment of Sexual Impotency, Tonic | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 83. | *Datura stramonium* L. | Solanaceae | Seed | n.r. | Sedative, Treatment of Addiction, Treatment of Colic | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
|     | *Datura stramonium* L. | Solanaceae | Seed | n.r. | Boiled and Paste | Khiregh-e Jangali, Ghasemloo valley | [9] Baharvand-Ahmedi et al. 2015 |
| 84. | *Daucus carota* L. | Apiaceae | Fruit | n.r. | Diuretic, Emmenagogue | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 85. | *Delphinium semibarbatum* Bien. ex Boiss | Ranunculaceae | Flower | n.r. | Treatment of Dermal Allergies, Coloring | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 86. | *Descurainia Sophia* (L.) Schr. | Brassicaceae | Fruit | Fresh food | Antiparasitic, Blood and Liver Cleanser, Jaundice, Febrifuge, Treatment of Furuncles, Antithirst, Laxative | Shiraz, Fars province | [6] Bahmani et al. 2016 |
|     | *Descurainia sophia* (L.) Webb ex Prantl | Brassicaceae | Seed | n.r. | | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 87. | *Dorema ammoniacum* D. Don | Apiaceae | Gum- Root | n.r. | Cystitis, Digestive, Treatment of Colic, Treatment of Furuncles, Expectorant, Antihelmintic, Emmenagogue, Anticovulsion | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 88. | *Drimia maritima* (L.) Stearn | Asparagaceae | Bulb | n.r. | Arthrodynia, Emmenagogue, Hair Tonic | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| No. | Species Name | Family | Location | Part Used | Use(s) | Reference |
|-----|--------------|--------|----------|-----------|--------|-----------|
| 89. | *Dysphania botrys* (L.) Mosyakin & Clemants | Amaranthaceae | Dermaneh Torki | Aerial parts | n.r. | Diabetes, Treatment of Sinusitis, Respiratory Disorders, Anthelmintic, Antacid, Antidiarrhea, Carminative, Urinary Antiseptic | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 90. | *Echinops cephalotes* DC. | Asteraceae | Shekar Tighal | Manna | n.r. | Antitussive, Anti-asthmatic, Pharyngitis, Febrifuge | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 91. | *Echium amoenum* Fisch. & C.A.Mey. | Boraginaceae | Gole Gavzaban | Flower | n.r. | Antihypertensive, Nerve Tonic, Diuretic, Antistress, Blood Cleanser Cardiac Tonic | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 92. | *Elaeagnus angustifolia* L. | Elaeagnaceae | Senjed | Fruit | n.r. | Arthrodynia, Antidiarrhea, Treatment of Rheumatism, Female Aphrodisiac | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 93. | *Ephedra major* Host | Ephedraceae | Khakestar Koshtar | Aerial parts | n.r. | Treatment of Joints Pain | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 94. | *Equisetum arvense* L. | Equisetaceae | Dome Asb | Aerial parts | n.r. | Obesity, Antilithiasis, Antihypertensive, Prostate Disorders, Treatment of kidney Disorders | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 94. | *Equisetum arvense* L. | Equisetaceae | Dome Asb | Aerial parts | Boiled | Hair Loss, Nails Strengthening | Khiregah-e Jangali, Ghasemloo valley | Baharvand-Ahmadi et al. 2015 |
| 94. | *Equisetum arvense* L. | Equisetaceae | n.r. | Aeration organ | Boiled | Antidiabetic | | Bahmani et al. 2014 |
| No. | Taxonomic Name | Family | Common Name | Part(s) Used | Use(s)                                                                 | Location | Reference |
|-----|----------------|--------|--------------|-------------|----------------------------------------------------------------------|----------|-----------|
| 95  | *Eremurus spectabilis* M. Bieb. | Xanthorrhoeaceae | Serish | Root | n.r. | Dermal Infection, Sticking, Antihyperlipidemia | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 96  | *Eruca sativa* (L.) Mill. | Brassicaceae | Mandah (Roghani cheragh) | Seed | n.r. | Sedative, Laxative, Diuretic, Stomach Tonic, | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 97  | *Euphorbia macroclada* Boiss. | Euphorbiaceae | Ferfion | Leaves | Paste | Wart | Khiregah-e Jangali, Ghasemloo valley | [9] Baharvand-Ahmadi et al. 2015 |
| 98  | *Falcaria vulgaris* Bernh. | Apiaceae | Ghaz Yaghi | Leaves - Fruit | n.r. | Treatment of Vitiligo, Cut, Wound | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 99  | *Ferula assa foetida* L. | Apiaceae | Anghozeh | Leaf | Herbal tea/decoction | Antiparasitic, Antihelmintic, Treatment of Colic, Emmenagogue | Shiraz, Fars province | [6] Bahmani et al. 2016 |
| 99  | *Ferula foetida* (Bunge) Regel | Apiaceae | Anghuzeh | Gum | n.r. | | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 100 | *Ferula gummosa* Boiss. | Apiaceae | Barijeh | Gum- Root | n.r. | Anthelmintic, Anticatarrhal, Anti-allergic, Dyspepsia, Appetizer, Emmenagogue | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 101 | *Ficus carica* L. | Moraceae | Anjir | Fruit | n.r. | Anti-hemorrhoids, Laxative, Tonic | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 102 | *Ficus johannis* Boiss. | Moraceae | Anjirevahshi | Fruit | Fresh food and herbal tea/decoction | Antiparasitic | Shiraz, Fars province | [6] Bahmani et al. 2016 |
| 103 | *Foeniculum vulgare* Mill. | Apiaceae | Razianeh | Fruit | n.r. | Galactogogue, Digestive, Bronchitis, | Mashhad city. | [5] Amiri and Joharchi 2013 |
| No. | Plant Species               | Family       | Part                | Use                                    | Location                      | Reference                      |
|-----|-----------------------------|--------------|---------------------|----------------------------------------|-------------------------------|--------------------------------|
| 104 | *Fraxinus excelsior* L.     | Oleaceae     | Zaban Gonjeshk Fruit | n.r. Appetizer, Antacid, Flatulence    | Mashhad city, Northeastern Iran | [8] Delfan et al. 2015          |
| 105 | *Fritillaria imperialis* L. | Liliaceae     | Laleh Sarnegun Root  | n.r. Treatment of Joints Pain          | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013     |
| 106 | *Fumaria asepala* Boiss.    | Fumariaceae  | Shahtareh Aerial parts | Boiled Head and Face Itching, Allergy, Face Acne | Khiregah-e Jangali, Ghasemlooo valley | [9] Baharvand-Ahmadi et al. 2015 |
| 107 | *Fumaria vaillantii* Loisel. | Papaveraceae | Shatareh Aerial parts | n.r. Pimples, Febrifuge, Blood Cleansing, Psoriasis, Appetizer, Antacid, Jaundice | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013     |
| 108 | *Gentiana olivieri* Griseb. | Gentianaceae | Suloo Flower n.r.   | Cardiac Ailments                       | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013     |
| 109 | *Glycyrrhiza glabra* L.     | Fabaceae     | Shirin Bayan Root    | n.r. Antitussive, Antacid, Tonic, Gastric Ulcer, Treatment of Hypotension, Treatment of Anemia | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013     |
| 110 | *Gundelia tournefortii* L.  | Asteraceae   | Kangar Aerial parts  | n.r. Liver Tonic, Treatment of Hepatitis | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013     |
| 111 | *Gundeliatournefortii*      | Asteraceae   | Kanghar Fruit Fresh food | Antiparasitic | Shiraz, Fars province | [6] Bahmani et al. 2016         |
| 112 | *Helichrysum graveolens* (M. Bieb.) Sweet | Asteraceae | Afsantin Aerial parts n.r. | Anodyne, Anthelmintic, Mashhad city. | Amiri and Joharchi 2013 |
|   | Species               | Family     | Part(s)   | Description                                      | Uses                                                                 | Location                                      | Reference                        |
|---|----------------------|------------|-----------|--------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------|-----------------------------------|
| 113. | *Heracleum persicum*  | Apiaceae   | Leaf, flower | Decoction n.r.                                   | Appetizer, Nerve Tonic, Stomach Ache Treatment of Hiccups, Appetizer, Flavoring, Carminative, Anthelmintic, Stomach Tonic | Lorestan province, Mashhad city, Northeaster n Iran | [8] Delfan et al. 2015           |
| 114. | *Hibiscus syriacus* L. | Malvaceae  | Flower    | n.r.                                             | Febrifuge, Antitussive                                               | Mashhad city, Northeaster n Iran              | [5] Amiri and Joharchi 2013       |
| 115. | *Hibiscus trionum* L. | Malvaceae  | Flower    | Boiled, boiled and brewed for washing            | Head Itching, Strengthening of Hair Root                              | Khiregah-e Jangali, Ghasemloo valley         | [9] Baharvand-Ahmadi et al. 2015 |
| 116. | *Humulus lupulus* L. | Cannabinaceae | Hops    | n.r.                                             | Diuretic, Treatment of Sleeplessness, Kidney Tonic, Calming, Sedative for Digestion | Mashhad city, Northeaster n Iran              | [5] Amiri and Joharchi 2013       |
| 117. | *Hymenocrater spp.* | Lamiaceae  | Aerial parts | n.r.                                             | Cardiac Tonic, Hypnotic, Antitussive, Carminative, Dyspnoea, Anti-stress Convulsion | Mashhad city, Northeaster n Iran              | [5] Amiri and Joharchi 2013       |
| 118. | *Hyoscyamus niger* L. | Solanaceae | Seed     | n.r.                                             | Sedative, Treatment of Addiction, Treatment of Toothache, Treatment of Headache, Antigout | Mashhad city, Northeaster n Iran              | [5] Amiri and Joharchi 2013       |
| 119. | *Hypecum pendulum*   | Apiaceae   | flowering shoot | Boiled                                           | Skin Allergy                                                        | Khiregah-e Jangali, Ghasemloo valley         | [9] Baharvand-Ahmadi et al. 2015 |
| No. | Species Name                  | Family      | Part    | Type   | Medical Uses                                                                 | Location                        | Reference                  |
|-----|------------------------------|-------------|---------|--------|------------------------------------------------------------------------------|---------------------------------|----------------------------|
| 120 | Hypericum scabrum L.         | Hypericaceae| Flower  | n.r.   | Antimigraine, Gastric Ulcer, Anti hemorrhage, Urinary Incontinence, Treatment of Headache | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013   |
| 121 | Indigofera argentea Burm.f.  | Fabaceae    | Leaves  | n.r.   | Antifungal, Hair Color, Hair Tonic                                           | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013   |
| 122 | Iris spuria L.               | Iridaceae   | Root    | n.r.   | Arthrodynia, Diuretic                                                        | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013   |
| 123 | Ixillirion tataricum (Pall.) Roem et Schult | Amaryllidaceae | Khiarak | Gland, flowering shoot | Paste | Washing of Skin Abscess and Disinfection of Infectious Wounds | Khiregah-e Jangali, Ghasemloo valley | Baharvand-Ahmadi et al. 2015 |
| 124 | Juglans regia                | Juglandaceae| Gerdou  |        | Fruit, trunk palm, leaves Boiled Anti-allergic, Hematopoietic                | Urmia county, Northwest Iran    | Bahmani et al. 2014       |
|     | Juglans regia                | Juglandaceae|        | Fruit, leaf, and skin Boiled Antidiabetic                                    | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013   |
|     | Juglans regia L.             | Juglandaceae| Gerdou  | Fruit-Leaves n.r.   | Boiled Eczema, Antidiarrhea, Hair Color                                      | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013   |
| 125 | Juniperus sabina L.          | Cupressaceae| Abhal   | Fruit  | n.r. Diuretic, Anti-lithiasis, Food Digestion, Urinary Antiseptic             | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013   |
| 126 | Lamium album L.              | Lamiaceae   | n.r.    | Flowering offshoot Boiled Antidiabetic                                        | Urmia county, Northwest Iran    | Bahmani et al. 2014       |
| No. | Scientific Name                  | Family     | Common Name | Form | Uses                                      | City, Province                     | Reference                          |
|-----|---------------------------------|------------|-------------|------|-------------------------------------------|------------------------------------|------------------------------------|
| 127 | *Lactuca sativa* L.             | Asteraceae | Kahu        | Seed | Anti-thirst, Hypnotic                      | Mashhad city, Northeastern Iran    | Amiri and Joharchi 2013            |
| 128 | *Lagenaria vulgaris*            | Cucurbitaceae | Kadoo      | Seed | Herbal tea/decoction, Antiparasitic       | Shiraz, Fars province              | Bahmani et al. 2016               |
| 129 | *Lallemantia iberica* (M.Bieb.) Fisch. & C.A. Mey. | Lamiaceae | Tokhm Sharbati | Seed | Gastric Ulcer, Antitussive, Laxative, Hoarseness, Anti-thirst | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013            |
| 130 | *Laurus nobilis* L.             | Lauraceae  | Barg Bu     | Leaves | Carminative, Appetizer, Flavor          | Mashhad city, Northeastern Iran    | Amiri and Joharchi 2013            |
| 131 | *Lawsonia inermis* L.           | Lythraceae | Hana        | Leaves | Hair Color, Treatment of Headache, Heart Tonic, Washing, Antifungal, Antiseptic | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013            |
| 132 | *Lepidium sativum* L.           | Brassicaceae | Shahi (Tartizak) | Seed | Appetizer, Anthelmintic, Laxative, Sore Throat | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013            |
| 133 | *Levisticum officinale* W.D.J.Koch | Apiaceae | Angedane roomi | Fruit | Nerve Diseases, Heart Tonic, Indigestion, Cholesterol-lowering, Antitussive, Laxative, Obesity, Bedsore | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013            |
| 134 | *Linum usitatissimum* L.        | Linaceae   | Katan       | Seed |                          | Mashhad city, Northeastern Iran    | Amiri and Joharchi 2013            |
| 135 | *Malva neglecta* Wallr.         | Malvaceae  | Nan Kalagh  | Flower - Fruit | Sore Throat, Antitussive, Febrifuge | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013            |
| No.  | Plant Name                        | Family    | Part(s)          | Name(s)        | Medicinal Uses                                                        | Location                          | References |
|------|----------------------------------|-----------|------------------|----------------|-----------------------------------------------------------------------|-----------------------------------|------------|
| 136  | *Malva sylvestris* L.            | Malvaceae | Panirak (Khatmi khabbzi) | Flower - Fruit | n.r.                                                                  | Pharyngitis, Furuncles, Aphthous Ulcers, Febrifuge, Antitussive, Jaundice, Laxative, Gastric Ulcer, Treatment of Wounds | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 137  | *Marrubium vulgare* L.           | Lamiaceae | Ferasion         | Aerial parts   | n.r.                                                                  | Liver Tonic, Antitussive          | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 138  | *Matricaria chamomilla* L.       | Asteraceae | Gole babooneh    | Flower         | n.r.                                                                  | Eczema, Antitussive, Anticatarrhal, Hair Tonic, Treatment of Colic, Menstrual Pains | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 139  | *Matricaria recutita*            | Asteraceae | Babooneh         | Flower, leaf   | Herbal tea/decoction                                               | Antiparasitic                      | Shiraz, Fars province | Bahmani et al. 2016 |
| 140  | *Medicago sativa* L.             | Fabaceae  | Yunjeh           | Aerial parts   | n.r.                                                                  | Appetizer, Tonic, Osteomalacia, Anti-hemorrhage | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 141  | *Melissa officinalis* L.         | Lamiaceae | Badranjbuyeh     | Aerial parts   | n.r.                                                                  | Nerve Tonic, Cardiac Tonic, Hypnotic, Antitussive, Carminative, Anti-stress, Convulsion | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 142  | *Mentha longifolia* (L.) Hudson  | Lamiaceae | Puneh            | Aerial parts   | n.r.                                                                  | Herpes, Anthelmintic, Antacid, Carminative, Antidiarrhea, Digestive | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 143  | *Mentha spicata* L.              | Lamiaceae | Naana            | Aerial parts   | n.r.                                                                  | Appetizer, Antacid, Carminative, Antidiarrhea, Digestive | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| No. | Species                        | Family     | Part(s) | Form(s) | Use(s)                                                      | Location                                      | Reference                |
|-----|-------------------------------|------------|---------|---------|------------------------------------------------------------|-----------------------------------------------|--------------------------|
| 144 | Morus nigra L.                | Moraceae   | Shatut  | Root    | Anodyne, Anthelmintic                                       | Abortion Mashhad city, Northeaster n Iran    | Amiri and Joharchi 2013  |
|     |                               |            |         | n.r.    | Abortion                                                   |                                               |                          |
| 145 | Myrtus communis L.            | Myrtaceae  | Murd    | Leaves - Fruit | Psoriasis, Treatment of Sinusitis, Mouth Ulcers, Antifungal, Treatment of Cold, Strengthening of Hair, Herpes | Abortion Mashhad city, Northeaster n Iran    | Amiri and Joharchi 2013  |
|     |                               |            |         | n.r.    | Abortion                                                   |                                               |                          |
| 146 | Nasturtium officinale R. Br.  | Brassicaceae | Alafe cheshmeh | Aerial parts | Diabetes, Dyspepsia                                         | Abortion Mashhad city, Northeaster n Iran    | Amiri and Joharchi 2013  |
|     |                               |            |         | n.r.    | Abortion                                                   |                                               |                          |
| 147 | Nasturtium officinalis (L.) R. Br. | Cruciferae | n.r.    | Leaf, root | Antidiabetic                                                | Urmia county, Northwest Iran                 | Bahmani et al. 2014      |
|     |                               |            |         |         | Abortion                                                   |                                               |                          |
| 148 | Nepeta binalouensis Jamzad    | Lamiaceae  | Ostokhodus | Aerial parts | Treatment of Cold, Carminative, Nerve Tonic, Treatment of Sinusitis, Pulmonary Infections, Treatment of Rheumatism, Anti-asthmatic, Antitussive, Cardiac Tonic | Abortion Mashhad city, Northeaster n Iran    | Amiri and Joharchi 2013  |
|     |                               |            |         | n.r.    | Abortion                                                   |                                               |                          |
| 149 | Nepeta bracteata Benth.      | Lamiaceae  | Zafa    | Aerial parts | Pulmonary Infections, Anti-asthmatic, Treatment of cold, Febrifuge, Treatment of Colic, Antitussive, Antidiabetic | Abortion Mashhad city, Northeaster n Iran    | Amiri and Joharchi 2013  |
|     | Nepeta bracteata Benth.      | Lamiaceae  | n.r.    | Flowering offshoot | Boiled, steamed                                          | Abortion Urmia county, Northwest Iran        | Bahmani et al. 2014      |
|     |                               |            |         |         | Abortion                                                   |                                               |                          |
| No.  | Species                        | Family       | Part            | Action                        | Location                        | Ref.       |
|------|-------------------------------|--------------|-----------------|-------------------------------|---------------------------------|-----------|
| 150  | *Nepeta menthoides* Boiss. & Buhse | Lamiaceae    | Ostokodus       | Aerial parts                  | Treatment of Cold, Nerve Tonic, Expectorant | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 151  | *Nepeta meyeri* Benth.         | Lamiaceae    | n.r.            | Flowering offshoot            | Antidiabetic                     | Urmia county, Northwest Iran    | [7] Bahmani et al. 2014 |
| 152  | *Nigella sativa*               | Ranunculaceae | Siah doom       | Seed                          | Herbal tea/decoction             | Kidney Stone, Carminative, Antacid, Galactogogue, Anthelmintic, Food Digestion, Antitussive, Treatment of Colic | Shiraz, Fars province, Mashhad city, Northeaster n Iran | [6] Bahmani et al. 2016 |
|      | *Nigella sativa* L.            | Ranunculaceae | Siah Daneh      | Seed                          | n.r.                            | [5] Amiri and Joharchi 2013     |
| 153  | *Nymphaea alba* L.             | Nymphaeaceae | Nilufar Abi     | Flower                        | Antiparasitic                    | Expectorant, Hypnotic, Antitussive, Calmative | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 154  | *Ocimum basilicum* L.          | Lamiaceae    | Reyhan (Tokhm sharbati) | Seed                          | n.r.                            | Aphthous Ulcers, Antiseptic, Antidiarrhea, Antitussive, Carminative, Laxative, Digestive, Antacid | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 155  | *Origanum vulgare* L.          | Lamiaceae    | Marzanjush      | Aerial parts                  | Treatment of Colic, Treatment of Sinusitis, Sedative, Cardiac Tonic, Nerve Tonic, Treatment of Dyspnoea | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 156  | *Oryza sativa* L.              | Poaceae      | Chaltooke Berenj | Seed coat                     | Hair Tonic, Treatment of Anemia  | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 157  | *Papaver rhoeas* L.            | Papaveraceae | Shaghayegh      | Flower                        | n.r.                            | Treatment of Addiction,         | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| No. | Plant Name                        | Family            | Part(s) | Form(s)       | Uses                                      | Location                          | Reference          |
|-----|-----------------------------------|-------------------|---------|---------------|-------------------------------------------|-----------------------------------|-------------------|
| 158.| *Papaver somniferum* L.          | Papaveraceae      | Fruit- Seed | n.r.          | Anodyne, Laxative, Tonic, Hypnotic         | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 159.| *Peganum harmala* L.             | Nitrariaceae      | Seed     | n.r.          | Diabetes, Antiseptic, Hypnotic, Treatment of Rheumatism and Sciatica Disorders, Anthelmintic, Emmenagogue | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 160.| *Perovskia abrotanoides* Kar.    | Lamiaceae         | Aerial parts | n.r.          | Treatment of Sinusitis, Treatment of Toothache, Antitussive, Nerve Tonic, Carminative, Sedative, Antiseptic, Anthelmintic, Treatment of Colic | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 161.| *Petroselinum crispum* (Mill.) Nyman ex A. W. Hill | Apiaceae          | Fruit     | n.r.          | Emmenagogue, Diuretic, Carminative, Kidney Disorders | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 162.| *Phleum pratense* L.             | Poaceae           | Branch   | Brew          | Stomach Ache                             | Lorestan province                 | [8] Delfan et al. 2015 |
| 163.| *Physalis alkekengi* L.          | Solanaceae        | Fruit     | n.r.          | Emmenagogue, Treatment of Kidney Stones, Blood Cleansing | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| No. | Plant Name                        | Family       | Part Used          | Use               | Place of Use | Author(s)       |
|-----|----------------------------------|--------------|--------------------|-------------------|--------------|-----------------|
| 164 | *Pimpinella anisum* L.          | Apiaceae     | Fruit n.r.         | Treatment of Flatulence, Anthelmintic, Treatment of Colic, Antacid, Stomach Ache, Antidiarrhea | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013 |
| 165 | *Pistacia atlantica* Desf. ssp kurdica | Anacardiaceae | Saghez Oleore sin n.r. | Appetizer, Digestive, Antacid | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013 |
| 166 | *Pistacia atlantica* Desf. ssp mutica | Anacardiaceae | Baneh Fruit n.r.  | Laxative, Tonic Stumulant, Treatment of Anemia | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013 |
| 167 | *Plantago major* L.            | Plantaginaceae | Barhang Seed-Leaves n.r. | Eczema, Anti-allergic, Febrifuge, Jaundice, Antitussive, Antidiarrhea, Toothache, Depurative, Gastric Ulcer | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013 |
| 168 | *Plantago ovata* Forssk.       | Plantaginaceae | Esfarzeh Seed n.r. | Obesity, Depilator, Tonsillitis, Antacid, Antitussive, Gastric Ulcer, Febrifuge, Laxative, Jaundice, Anti-hemorrhoids | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013 |
| 169 | *Platanus orientalis* L.       | Platanaceae   | Chenar Fruit n.r.  | Prostate Diseases | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013 |
| 170 | *Polygonatum orientale* Desf.  | Asparagaceae  | Shagghahol Root n.r. | Tonic, Diuretic, Nerve Tonic, Aphrodisiac | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013 |
| 171 | *Polygonum aviculare* L.       | Polygonaceae  | Alaf Haftband n.r. Aerial parts n.r. | Diabetes, Treatment of Colic, Antidiarrhea | Mashhad city, Northeaster n Iran | Amiri and Joharchi 2013 |
|     | *Polygonum aviculare* L.       | Polygonaceae  | Boiled Antidiabetic |               |              | [7]    |
| No.  | Species                | Family            | Place of Collection | Habitat/Part Used | Activity                                                                 | Source                                                                 |
|------|------------------------|-------------------|--------------------|-------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------|
| 172  | *Polypodium vulgare* L. | Polypodiaceae     | Baspayak           | Root              | n.r. Expectorant, Jaundice, Digestive | Mashhad city, Northwest Iran Amiri and Joharchi 2013 |
| 173  | *Portulaca oleracea* L. | Portulacaceae     | Khorfeh            | Seed-Leaves       | n.r. Antitussive, Febrifuge, Anti-thirst, Food Digestion, Depurative, Anti-hemorrhoids | Mashhad city, Northeastern Iran Amiri and Joharchi 2013 |
| 174  | *Punica granatum*      | Punicaceae        | Anar-doun          | Seed              | n.r. Pomegranate fruits cooked under hot wood ashes and eat Peptic Ulcer Anti-hemorrhage, Blood Flux, Anthelmintic | Lorestan province Mashhad city, Northeastern Iran Amiri and Joharchi 2013 |
|      | *Punica granatum* L.   | Punicaceae        | Gole Anar          | Flower-Root       | n.r. Oak fruit crushed and mixed with yogurt and eat                     | Stomach Ache Lorestan province Amiri and Joharchi 2013 |
| 175  | *Quercus branti*       | Fagaceae          | Bali               | Pith leaf peel    | n.r. Nosebleed, Anti-hemorrhage, Uterus Ailments, Mouth Wounds, Anti-hemorrhoids | Mashhad city, Northeastern Iran Amiri and Joharchi 2013 |
| 176  | *Quercus infectoria* Oliv. | Fagaceae          | Mazuye sabz        | Insect gull       | n.r. Antidiarrhea, Anti-hemorrhage                                       | Mashhad city, Northeastern Iran Amiri and Joharchi 2013 |
| 177  | *Quercus spp.*         | Fagaceae          | Balut (Mazu)       | Fruit             | n.r. Antidiarrhea, Anti-hemorrhage                                       | Mashhad city, Northeastern Iran Amiri and Joharchi 2013 |
| 178  | *Rheum ribes* L.       | Polygonaceae      | Rivas              | Fruit-Petiole     | n.r. Jaundice, Urinary Antiseptic, Diuretic, Depurative, Liver Tonic, Antiseptic, Hair Tonic | Mashhad city, Northeastern Iran Amiri and Joharchi 2013 |
| 179. | *Rheum turkestanicum* Janisch. | Polygonaceae | Eshghan | Root | n.r. | Diabetes, Antihypertensive, Anticancer, Depurative | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 180. | *Rhus coriaria* L. | Anacardiaceae | Somagh | Fruit | n.r. | Antidiarrhea, Antihemorrhage, Flavoring, Blood Refining | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
|       | *Rhus coriaria* L. | Anacardiaceae | n.r. | Fruit, leaf, resin | Boiled | | | |
| 181. | *Ribes khorasanicum* Saghafi & Assadi | Grossulariaceae | Ghareh Ghat | Fruit | n.r. | Antihypertensive, Diabetes, Depurative | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 182. | *Ricinus communis* L. | Euphorbiaceae | Karchak | Seed | n.r. | Purgative | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 183. | *Rosa beggeriana* Schrenk | Rosaceae | Nastaran | Fruit | n.r. | Antihypertensive, Diuretic, Kidney Stone | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 184. | *Rosa damascena* Mill. | Rosaceae | Gole Mohammadi | Flower | n.r. | Anti-hemorrhoid, Laxative, Calmative | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 185. | *Rosa foetida* Hermam. | Rosaceae | n.r. | Petal | Boiled | Antidiabetic | Urmia county, Northwest Iran | [7] Bahmani et al. 2014 |
|       | *Rosa foetida* Herrm. | Rosaceae | Gole Zard | Flower | n.r. | Ovary Tonic, Emmenagogue | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 186. | *Rubia tinctorum* L. | Rubiaceae | Ronas | Root | n.r. | Strengthening of Hair, Hair Color | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
|       | *Rubia tinctorum* L. | Rubiaceae | Ronnas | Root, fruit | Boiled | | | |
| No. | Species                  | Family       | Part(s)       | Use(s)                  | Region/Source                                      |
|-----|--------------------------|--------------|---------------|-------------------------|---------------------------------------------------|
| 187 | Rumex acetosella L.      | Polygonaceae | Sagh Torshak  | Root, n.r.              | Jaundice, Febrifuge, Mashhad city, Northeaster Iran |
|     |                          |              |               |                         | Amiri and Joharchi 2013                            |
| 188 | Rumex sculantus L.       | Polygonaceae | n.r.          | Fruit, leaf, Raw use, boiled | Blood Refining, Urmia county, Northwest Iran      |
|     |                          |              |               |                         | Bahmani et al. 2014                                |
| 189 | Ruta graveolens L.       | Rutaceae     | Sodab         | Aerial parts, n.r.      | Abortion, Sedative, Emmenagogue, Mashhad city, Northeaster Iran |
|     |                          |              |               |                         | Amiri and Joharchi 2013                            |
| 190 | Salix aegyptiaca L.      | Salicaceae   | Bidmeshk      | Flower, n.r.            | Calmative, Cardiac Tonic, Painful Menstruation, Mashhad city, Northeaster Iran |
|     |                          |              |               |                         | Amiri and Joharchi 2013                            |
| 191 | Salix alba L.            | Salicaceae   | Bid           | Leaves-Bark, n.r.       | Menstrual Pains, Anodyne, Jaundice, Antitussive, Mashhad city, Northeaster Iran |
|     |                          |              |               |                         | Amiri and Joharchi 2013                            |
| 192 | Salix excelsa J.F. Gmel. | Salicaceae   | Bidkhesht     | Manna, n.r.             | Febrifuge, Jaundice, Laxative, Mashhad city, Northeaster Iran |
|     |                          |              |               |                         | Amiri and Joharchi 2013                            |
| 193 | Salvia leriifolia Benth. | Lamiaceae    | Noruzak       | Aerial parts, n.r.      | Diabetes, Period Regulator, Mashhad city, Northeaster Iran |
|     |                          |              |               |                         | Amiri and Joharchi 2013                            |
| 194 | Salvia macrosiphon Boiss.| Lamiaceae    | Kenocheh      | Seed, n.r.              | Jaundice, Antitussive, Febrifuge, Gastric Ulcer, Pharyngitis, Laxative, Mashhad city, Northeaster Iran |
|     |                          |              |               |                         | Amiri and Joharchi 2013                            |
| 195 | Salvia nemorosa L.       | Lamiaceae    | n.r.          | Flowering offshoot, Boiled | Antidiabetic, Urmia county, Northwest Iran          |
|     |                          |              |               |                         | Bahmani et al. 2014                                |
| 196. | **Sanguisorba minor** Scop. | Rosaceae | Tout-e roubahi | Fruit | Boiled and edible raw | Skin Wounds Disinfection | Khiregh-e Jangali, Ghasemlou valley | [9] Baharvand-Ahmadi et al. 2015 |
| 197. | **Satureja hortensis** L. | Lamiaceae | Marzeh | Aerial parts | n.r. | Indigestion, Antidiabetic | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 198. | **Satureja khozistanica** | Lamiaceae | Jataneh | Branch | Dried leaves poured on food | Kidney Troubles, Antidiarrhea, Treatment of Joints Pain | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 199. | **Scrophularia striata** Boiss. | Scrophulariaceae | Mokhallaseh | Aerial parts | n.r. | Diabetes, Antihyperlipidemia | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 200. | **Securigera securidaca** (L.) Degen & Dorfl. | Fabaceae | Gandeh Talkheh | Seed | n.r. | Blood Tonic, Hair Loss, Strengthening of Memory, Increase Sperm Count, Treatment of Skin’s Split, Laxative | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 201. | **Sesamum indicum** L. | Pedaliaceae | Konjed | Seed | n.r. | Jaundice, Febrifuge, Antihepatitis, Liver Tonic | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 202. | **Silybum marianum** (L.) Gaertn. | Asteraceae | Khare Maryam | Seed | n.r. | Treatment of Osteoarthritis, Mastitis, Expectorant | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| 203. | **Solanum americanum** Mill. | Solanaceae | Tajrizi | Fruit | n.r. | | Mashhad city, Northeastern Iran | [5] Amiri and Joharchi 2013 |
| No. | Species | Family | Part | Method | Effect | Location | Reference |
|-----|---------|--------|------|--------|--------|----------|-----------|
| 204 | **Sophora alopecuroides** | Fabaceae | n.r. | Inflorescence | Boiled | Antidiabetic | Urmia county, Northwest Iran | Bahmani et al. 2014 |
| 205 | **Stachys lavandulifolia Vahl** | Lamiaceae | Chai Kuhi | Flower | n.r. | Nerve Tonic, Treatment of cold, Cardiac Tonic, Treatment of Colic | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 206 | **Tanacetum parthenium (L.) Sch. Bip.** | Asteraceae | Gole babooneh | Flower | n.r. | Antitussive, Anticatarrhal, Hair Tonic, Treatment of Colic, Menstrual Pains | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 207 | **Teucrium orientale L.** | Lamiaceae | n.r. | Leaf | Boiled | Antidiabetic | Urmia county, Northwest Iran | Bahmani et al. 2014 |
| 208 | **Teucrium polium** | Lamiaceae | Maryam-nokhodi | Flower, Seed | Brew | Stomach Ache, Antacid, Indigestion, Diabetes, Treatment of Colic, Antidiarrhea | Mashhad city, Northeastern Iran | Delfan et al. 2015 |
| 209 | **Teucrium polium L.** | Lamiaceae | Kalpureh | Aerial parts | n.r. | | | Amiri and Joharchi 2013 |
|  | **Teucrium polium L.** | Lamiaceae | n.r. | Flowering offshoot | Boiled | Antidiabetic | | Bahmani et al. 2014 |
| 209 | **Teucrium polium** | Lamiaceae | Maryam-nokhodi | Flower, Seed | Brew | Stomach Ache, Antacid, Indigestion, Diabetes, Treatment of Colic, Antidiarrhea | Mashhad city, Northeastern Iran | Delfan et al. 2015 |
| 210 | **Thalictrum sultanabadense Stapf** | Ranunculaceae | Parsiavashan | Aerial parts | n.r. | Antitussive, Febrifuge | Mashhad city, Northeastern Iran | Amiri and Joharchi 2013 |
| 210 | **Thymus daenensis** | Lamiaceae | Azboue | Flower, leaf, branch | Decoction | Stomach Ache | Lorestan province | Delfan et al. 2015 |
| 211 | **Thymus kotschyanus** | Lamiaceae | Azboue | Flower, leaf, branch | Decoction | Stomach Ache | Lorestan province | Delfan et al. 2015 |
| No. | Species                  | Family       | Geographic Region | Part of Plant | Preparation | Medical Use                                                                 | Reference                  |
|-----|--------------------------|--------------|-------------------|---------------|-------------|----------------------------------------------------------------------------|-----------------------------|
| 212 | *Thymus pubescens*       | Lamiaceae    | Azboue            | Flower, leaf, branch | Decoction   | Stomach Ache                                                               | Lorestan province [8] Delfan et al. 2015 |
| 213 | *Thymus fallax*          | Lamiaceae    | Azboue            | Flower, leaf, branch | Decoction   | Stomach Ache                                                               | Lorestan province [8] Delfan et al. 2015 |
| 214 | *Thymus. eriocalyx*      | Lamiaceae    | Azboue            | Flower, leaf, branch | Decoction   | Stomach Ache                                                               | Lorestan province [8] Delfan et al. 2015 |
| 215 | *Tilia cordata* Mill.    | Malvaceae    | Zirfun            | Leaves - Fruit    | n.r.        | Nerve Tonic, Sudorific, Diuretic, Calmative                               | Mashhad city, Northeaster n Iran Amiri and Joharchi 2013 |
| 216 | *Trachyspermum anui* (L.) Sprague | Apiaceae | Zenyan (Khordaneh) | Fruit           | n.r.        | Carminative, Anthelmintic, Antidiarrhea, Treatment of Colic, Antacid, Galactogogue | Mashhad city, Northeaster n Iran Amiri and Joharchi 2013 |
| 217 | *Tragapogon caricifolius* | Compositae   | Sheng             | Flower           | Brew, raw, dried | Stomach Ache                                                               | Lorestan province [8] Delfan et al. 2015 |
| 218 | *Tribulus terrestris* L. | Zygophyllaceae | Kharkhasak        | Aerial parts     | n.r.        | Diuretic, Kidney Stone, Tonic, Treatment of Prostate, Hypertrophy, Anthelmintic, Jaundice, Treatment of Flooding, Treatment of Dysuria, Urinary Antiseptic | Mashhad city, Northeaster n Iran Amiri and Joharchi 2013 |
| 219 | *Trichodesma incanum* (Bunge) A. DC. | Boraginaceae | Alaf-e-simkesh    | Aerial parts     | n.r.        | Treatment of Bone Fracture                                                 | Mashhad city, Northeaster n Iran Amiri and Joharchi 2013 |
| 220 | *Trifolium pratense* L.  | Fabaceae     | n.r.              | Flowering offshoot | Boiled     | Antidiabetic                                                               | Urmia county, Northwest Iran Bahmani et al. 2014 |
| 221 | *Trifolium purpureum* Loisel. | Fabaceae    | n.r.              | Flowering offshoot | Boiled     | Antidiabetic                                                               | Urmia county, Northwest Iran Bahmani et al. 2014 |
| No.  | Common Name                                      | Family     | Part Used       | Application                                      | Place of Use | Reference       |
|------|-------------------------------------------------|------------|-----------------|--------------------------------------------------|--------------|----------------|
| 222. | Trigonella foenum-graecum L.                    | Fabaceae   | Seed n.r.       | Diabetes, Bronchitis, Osteomalacia, Antihyperlipidemia, Tonic, Treatment of Anemia | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 223. | Tripleurospermum disciforme (C. A. Mey.) Sch.Bip. | Asteraceae  | Flower n.r.     | Treatment of Cough, Febrifuge                     | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 224. | Tussilago farfara L.                            | Asteraceae  | Aerial parts n.r.| Expectorant, Antitussive, Mouth Wounds, Treatment of Furuncles | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 225. | Urtica dioica L.                                | Urticaceae  | Whole plant n.r.| Hypoglycemic, Enlarged Prostate, Anemia, Anti-inflammatory, Digestive Antidiabetic | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
|      | Urtica dioica L.                                | Urticaceae  | Seed, aeration organ Boiled | Anaphylaxis and Constipation | Urmia county, Northwest Iran | [7] Bahmani et al. 2014 |
| 226. | Urtica pilulifera L.                            | Urticaceae  | Seed n.r.       | Laxative, Treatment of Cough                      | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 227. | Vaccaria oxyodonta Boiss.                       | Caryophyllaceae | Flower Boiled | Skin Allergy and Constipation                     | Khiregah-e Jangali, Ghasemloo valley | [9] Baharvand-Ahmadi et al. 2015 |
| 228. | Vaccinium arctostaphylos L.                     | Ericaceae   | Fruit n.r.      | Diabetes, Depurative, Antihypertensive, Calmative | Mashhad city, Northeaster n Iran | [5] Amiri and Joharchi 2013 |
| 229. | Verbascum agrimonifolium                       | Scrophulariaceae | Leaves, flower Boiled | Wound Microbial Infection | Khiregah-e Jangali, Ghasemloo valley | [9] Baharvand-Ahmadi et al. 2015 |
| 230. | Verbascum cheiranthifolium Boiss.               | Scrophulariaceae | Aerial parts n.r. | Dyspepsia, Antidiarrhea, Expectorant, | Mashhad city | [5] Amiri and Joharchi 2013 |
| No.  | Plant Name                     | Family       | Part(s) Used     | Preparation  | Medical Use                                                                 | Location/Date References |
|------|-------------------------------|--------------|------------------|--------------|------------------------------------------------------------------------------|--------------------------|
| 231. | Verbascum macrocarpum Boiss.  | Scrophulariaceae | Gol-e mahour | Leaves, flower, Boiled | Antiacid, Stomach Tonic, Nails Fungal Infection | Khiregah-e Jangali, Ghasemloo valley/ Baharvand-Ahmadi et al. 2015 |
| 232. | Verbascum speciosum Schord.   | Scrophulariaceae | Gol-e mahour | Leaves, flower, Paste | Wound Microbial Infection | Khiregah-e Jangali, Ghasemloo valley/ Baharvand-Ahmadi et al. 2015 |
| 234. | Verbena officinalis L.         | Verbenaceae   | Shahpasand      | Aerial parts, n.r. | Appetizer, Indigestion | Mashhad city, Northeaster n Iran/ Amiri and Joharchi 2013 |
| 235. | Viola odorata L.               | Violaceae     | Banafsheh       | Flower, n.r.    | Eczema, Febrifuge, Blood Cleansing, Jaundice, Treatment of Cold, Expectorant | Mashhad city, Northeaster n Iran/ Amiri and Joharchi 2013 |
| 236. | Viola tricolor                 | Umbelliferae  | Golebenoushe    | Flower branch, Decoction | Stomach Ache, Treatment of Sinusitis | Lorestan province/ Delfan et al. 2015 |
| 237. | Vitex negundo L.               | Lamiaceae     | Felfel Kuhi     | Fruit, n.r.     | Menstrual Regulator, Obesity, Treatment of Sinusitis | Mashhad city, Northeaster n Iran/ Amiri and Joharchi 2013 |
| 238. | Zataria multiflora Boiss.      | Lamiaceae     | Avishan Shirazi | Aerial parts, n.r. | Treatment of Sinusitis, Menstrual Pains, Dysmenorrhreal, Anthelmintic, Antacid, Treatment of Colic, Anti-asthmatic, Dyspnoea, Arthrodyinia, Carminative | Mashhad city, Northeaster n Iran/ Amiri and Joharchi 2013 |
| 239. | Zataria multiflora             | Lamiaceae     | Avishan        | Leaf | Herbal tea/decoction, Antiparasitic | Shiraz, Fars province/ Bahmani et al. 2016 |
| 240. | Zea mays L.                    | Poaceae       | Kakole Zorat    | Style, n.r.     | Obesity, Anti-inflammatory, Anti-lithiasis, | Mashhad city, Northeaster n Iran/ Amiri and Joharchi 2013 |
| No. | Species                      | Family   | Place Name  | Part Used  | Effects                                      | Place of Use                        | Ref.  |
|-----|-----------------------------|----------|-------------|------------|----------------------------------------------|--------------------------------------|-------|
| 241 | Ziziphora clinopodioides Lam.| Lamiaceae | Avishan kuhi| Aerial parts| Kidney Disorders, Prostate Disorders, Diuretic| Mashhad city, Northeastern Iran     | [5] Amiri and Joharchi 2013 |
|     |                             |          |             | n.r.       | Kidney Pain, Antacid, Carminative, Treatment of Colic, Anthelmintic, Antitussive, Antidiarrhea, Digestive |                         |       |
| 242 | Ziziphora teniuor L.         | Lamiaceae | Kakuti      | Aerial parts| Digestive, Treatment of Colic, Calefacient, Antacid, Antiseptic | Mashhad city, Northeastern Iran     | [5] Amiri and Joharchi 2013 |
|     |                             |          |             | n.r.       |                                              |                         |       |
| 243 | Ziziphus jujuba Miller      | Rhamnaceae | Annab      | Fruit      | Depurative, Febrifuge, Laxative, Jaundice, Antitussive, Treatment of Thirst | Mashhad city, Northeastern Iran     | [5] Amiri and Joharchi 2013 |
|     |                             |          |             | n.r.       |                                              |                         |       |
| 244 | Ziziphus spina-christi      | Rhamnaceae | Konar      | Flower, leaf| Stomach Ache, Eczema, Hair Tonic, Antifungal, Antipruritic, Washing | Lorestan province               | [8] Delfan et al. 2015 |
|     | Ziziphus spina-christi (L.) Willd. | Rhamnaceae | Sedr       | Leaves     |                                              | Mashhad city, Northeastern Iran     | [5] Amiri and Joharchi 2013 |
| 245 | Ziziphus nummularia         | Rhamnaceae | Melim      | Leaf, root | Peptic Ulcer                                 | Lorestan province               | [8] Delfan et al. 2015 |
|     |                             |          |             | Decoction  |                                              |                         |       |
| 246 | Zosima orientalis Hoffm.    | Apiaceae  | Angedane roomi| Fruit   | Nerve Diseases, Indigestion                  | Mashhad city, Northeastern Iran     | [5] Amiri and Joharchi 2013 |
|     |                             |          |             | n.r.       |                                              |                         |       |
3.2. Biological Activities of Plants Grown and Collected in Iran

A bibliographic search was conducted, focusing on biological activities of plants collected in the Iranian territory. The purpose of this section is to collect data related to scientific studies in order to evidence potential correlations between traditional treatments and proved biological activities of plants and phytocomplexes obtained from them. The results are summarized in Table 2.

Table 2. Biological activities of plants collected in the Iranian territory. Scientific name, family, type of extract, part of the plant used, Authors. (N.r. = not reported).

| Family | Plant | Plant Part(s) Used | Author(s) |
|--------|-------|--------------------|-----------|
| **Achillea millefolium** | Asteraceae | Methanolic extract | Aerial parts | [10] Lotfipour et al. 2008 |
| **Alhagi maurorum Medik.** | Leguminosae | Methanolic extract (Lyophilized) | Leaves | [11] Bonjar et al. 2004 |
| **Beta vulgaris** | Amaranthaceae | Ethanolic extract | Aerial parts | [12] Koochak et al. 2010 |
| **Cuminum cyminum L.** | Apiaceae | Methanolic extract (Lyophilized) | Leaves | [11] Bonjar et al. 2004 |
| **Dorema ammoniacum** | Apiaceae | Methanolic extract | Seeds | [13] Abedini et al. 2014 |
| **Echinophora orientalis** | Apiaceae | Aqueous extract | Leaves | [14] Sepahi et al. 2014 |
| **Etchium italicum** | Boraginaceae | Methanolic extract | Aerial parts | [10] Lotfipour et al. 2008 |
| **Ferula assa-foetida** | Apiaceae | Methanolic extract | Seeds | [13] Abedini et al. 2014 |
| **Ferula foetida Regel** | Apiaceae | Methanolic extract | Roots | [15] Chitsazian-Yazdi et al. 2015 |
| **Ferula gummosa** | Apiaceae | Aqueous extract | Leaves | [14] Sepahi et al. 2014 |
| **Ferulago contracta** | Apiaceae | Methanolic extract | Seeds | [13] Abedini et al. 2014 |
| **Lawsonia inermis L.** | Lythraceae | Methanolic extract (Lyophilized) | Leaves | [11] Bonjar et al. 2004 |
| **Malva sylvestris L.** | Malvaceae | Methanolic extract | Flowers | [16] Razavi et al. 2011 |
| **Nasturtium microphyllum** | Brassicaceae | Aqueous extract | Leaves | [14] Sepahi et al. 2014 |
| **Nymphaea alba L.** | Nymphaeaceae | Methanolic extract (Lyophilized) | Leaves | [11] Bonjar et al. 2004 |
| **Perovskia abrotanoides** | Lamiaceae | Methanolic extract | Aerial parts | [13] Abedini et al. 2014 |
| **Polygonum patulum M. Bieb.** | Polygonaceae | Ethanolic extract | Aerial parts | [12] Koochak et al. 2010 |
| **Rheum ribes L.** | Polygonaceae | Methanolic extract (Lyophilized) | Leaves | [11] Bonjar et al. 2004 |
| **Rhus coriaria L.** | Anacardiaceae | Methanolic extract (Lyophilized) | Leaves | [11] Bonjar et al. 2004 |
| **Rumex obtusifolius** | Polygonaceae | Ethanolic extract | Aerial parts | [12] Koochak et al. 2010 |
| **Salvia sahendica** | Lamiaceae | Methanolic extract | Aerial parts | [10] Lotfipour et al. 2008 |
| **Satureja bachtiarica** | Lamiaceae | Hydro-distillation and ethanolic extract | Leaves and flowers | [17] Pirbalouti et al. 2010 |
| **Thalictrum minus** | Ranunculaceae | Methanolic extract | Aerial parts | [10] Lotfipour et al. 2008 |
| **Thymus daenensis** | Lamiaceae | Hydro-distillation and ethanolic extract | Leaves and flowers | [17] Pirbalouti et al. 2010 |
| Species                        | Family          | Preparation                                      | Part              | Reference                     |
|-------------------------------|-----------------|--------------------------------------------------|-------------------|-------------------------------|
| *Trachyspermum ammi* L.       | Apiaceae        | Methanolic extract (Lyophilized)                 | Leaves            | [11] Bonjar et al. 2004       |
| *Trachyspermum copticum*      | Apiaceae        | Methanol/petroleum benzene/diethyl ether extract | Aerial parts      | [18] Nariman et al. 2004      |
| *Trigonella foenum-graecum* L.| Leguminosae     | Methanolic extract (Lyophilized)                 | Leaves            | [11] Bonjar et al. 2004       |
| *Verbascum Thapsus*           | Scrophulariaceae| Aqueous extract                                   | Leaves            | [14] Sepahi et al. 2014       |
| *Xanthium brasiliicum*        | Compositae      | Methanol/petroleum benzene/diethyl ether extract | Aerial parts      | [18] Nariman et al. 2004      |

**Antifungal Activity**

| Species                        | Family          | Preparation                                      | Part              | Reference                     |
|-------------------------------|-----------------|--------------------------------------------------|-------------------|-------------------------------|
| *Satureja bachtiarica*         | Lamiaceae       | Hydro-distillation                               | Leaves            | [19] Pirbalouti et al. 2009   |
| *Scrophularia striata*         | Scrophulariaceae| Infusion                                         | Leaves and stems  | [19] Pirbalouti et al. 2009   |
| *Thymus daenensis*             | Lamiaceae       | Hydro-distillation                               | Leaves            | [19] Pirbalouti et al. 2009   |
| *Trachyspermum ammi*           | Apiaceae        | Hydro-distillation                               | Fruits            | [19] Pirbalouti et al. 2009   |
| *Zhumeria majdae*              | Lamiaceae       | Hydro-distillation                               | Aerial parts      | [20] Imani et al. 2015        |
| *Ziziphus spinachristi*        | Rhamnaceae      | Infusion                                         | Fruits            | [19] Pirbalouti et al. 2009   |

**Antimalarial Activity**

| Species                        | Family          | Preparation                                      | Part              | Reference                     |
|-------------------------------|-----------------|--------------------------------------------------|-------------------|-------------------------------|
| *Citrullus colocynthis*        | Cucurbitaceae   | Methanolic extract                               | Fruits            | [21] Feiz Haddad et al. 2017   |
| *Physalis alkekengi*           | Solanaceae      | Methanolic extract                               | Leaves and fruits | [21] Feiz Haddad et al. 2017   |
| *Scrophularia frigida*         | Scrophulariaceae| Dichloromethane extract                          | Aerial parts      | [22] Afshar et al. 2018       |
| *Solanum nigrum*               | Solanaceae      | Methanolic extract                               | Fruits            | [21] Feiz Haddad et al. 2017   |

**Antioxidant Activity**

| Species                        | Family          | Preparation                                      | Part              | Reference                     |
|-------------------------------|-----------------|--------------------------------------------------|-------------------|-------------------------------|
| *Convolvulus persicus*         | Convolvulaceae  | Methanol extract                                 | Roots             | [23] Dehghan et al. 2016      |
| *Heracleum persicum*           | Apiaceae        | n-Hexane extract (subsequently fractionated)     | Roots             | [24] Dehghan et al. 2017      |
| *Hyssopus angustifolius*       | Lamiaceae       | Ethyl acetate extracts                           | Stems, Leaves, Owes| [25] Alinezhad et al. 2012    |
| *Hyssopus officinalis*         | Lamiaceae       | Ethyl acetate and n-butanol extracts              | Aerial parts      | [26] Fathiazad et al. 2011    |
| *Mellilotus officinalis*       | Leguminosae     | Methanolic extract                               | Whole plant       | [27] Pourmorad et al. 2006    |
| *Primula heterochroma*         | Primulaceae     | Methanolic extract Ethyl acetate extract          | Leaves            | [23] Dehghan et al. 2016      |
| *Pyrus boissieriana*           | Rosaceae        | Methanolic extract                               | Leaves and stems  | [23] Dehghan et al. 2016      |
| *Quercus infectoria*           | Fagaceae        | Methanolic extract                               | Galls             | [28] Khazaeei et al. 2009     |
| *Salix aegyptiaca* L.          | Salicaceae      | Methanolic extract                               | Male inflorescences| [29] Sonboli et al. 2010      |
| *Stachys inflata*              | Lamiaceae       | Methanolic extract polar and non-polar fractions | Aerial parts      | [30] Ebrahimabadi et al. 2010 |
| **Terminalia chebula** | Combretaceae | Methanolic extract | Fruits | [28] Khazaeei et al. 2009 |
| **Tetrataenium lasiopetalum** | Apiaceae | Hydro-alcoholic extract | Laminas, Stems, Petioles, Fruits, Peduncle, Flowers | [31] Dehshiri et al. 2013 |

**Anticancer/Cytotoxic Activity**

| **Anthemis mirheydari** | Compositae | Dichloromethane extract | Whole plant | [32] Jassbi et al. 2016 |
| **Euphorbia szovitsii Fisch. & C.A. Mey.** | Euphorbiaceae | Hydro-alcoholic extract | Aerial parts | [33] Asadi-Samani et al. 2018 |
| **Ferula foetida Regel** | Apiaceae | Methanolic extract | Roots | [15] Chitsazian-Yazdi et al. 2015 |
| **Ferula szowitsiana** | Apiaceae | Methanolic extract (fractionated) | Roots | [34] Sahanavar-Yazdi et al. 2009 |
| **Hypericum scabrum** | Hypericaceae | Methanolic extract (fractionated) | Leaves | [35] Hamzeloo-Moghadam et al. 2015 |
| **Malva sylvestris L.** | Malvaceae | Methanolic extract | Flowers and leaves | [16] Razavi et al. 2011 |
| **Medicago sativa** | Leguminosae | Hydro-alcoholic extract | Aerial parts | [33] Asadi-Samani et al. 2018 |
| **Mentha lonigfolia** | Lamiaceae | Methanolic extract | Aerial parts | [36] Esmaeilbeig et al. 2015 |
| **Satureja bachtiarica** | Lamiaceae | Methanolic extract | Aerial parts | [36] Esmaeilbeig et al. 2015 |
| **Satureja hortensis** | Lamiaceae | Methanolic extract | Aerial parts | [36] Esmaeilbeig et al. 2015 |
| **Thymus daenensis** | Lamiaceae | Methanolic extract | Aerial parts | [36] Esmaeilbeig et al. 2015 |
| **Thymus vulgaris** | Lamiaceae | Methanolic extract | Aerial parts | [36] Esmaeilbeig et al. 2015 |
| **Urtica dioica** | Urticaceae | Hydro-alcoholic extract | Aerial parts | [33] Asadi-Samani et al. 2018 |

**Antidiabetic Activity**

| **Heracleum persicum** | Apiaceae | n-hexane extract | Aerial parts, roots | [23] Dehghan et al. 2016 and [24] Dehghan et al. 2017 |
| **Parrotia persica** | Hamamelidaceae | Ethyl acetate and methanolic extract | Leaves | [23] Dehghan et al. 2016 |
| **Primula heterochroma** | Primulaceae | Methanolic and ethyl acetate extract | Leaves and roots | [23] Dehghan et al. 2016 |
| **Pyrus boissieriana** | Rosaceae | Methanolic, n-hexane, Ethyl acetate extract | Leaves and stems | [23] Dehghan et al. 2016 |
| **Salvia officinalis L** | Lamiaceae | Hydro-alcoholic extract | Leaves | [37] Hasanein et al. 2016 |
| **Smilax excelsa** | Smilacaceae | Ethyl acetate and n-hexane extract | Stems and leaves | [23] Dehghan et al. 2016 |

**Iron Chelating Activity**

| **Epilobium hirsutum** | Onagraceae | n.r. | Leaves | [38] Ebrahimzadeh et al. 2008 |
| **Feijoa sellowiana** | Myrtaceae | Infusion and methanolic extract | Fruits and leaves | [38] Ebrahimzadeh et al. 2008 |
| **Melilotus arvensis** | Fabaceae | n.r. | Leaves | [38] Ebrahimzadeh et al. 2008 |
| **Pistacia lentiscus** | Anacardiaceae | n.r. | Gum | [38] Ebrahimzadeh et al. 2008 |

**Anti-Platelet Aggregation Activity**
### Inhibition of Mushroom Tyrosinase

| Plant Name | Family | Type of Extract | Part Used | Reference |
|------------|--------|-----------------|-----------|-----------|
| *Allium atrovioleum* | Amaryllidaceae | Hydro-distillation | Aerial parts | [39] Lorigooini et al. 2014 |
| *Amarum infectoria* | Fagaceae | Methanolic extract | Galls | [28] Khazaelli et al. 2009 |
| *Terminalia chebula* | Combretaceae | Methanolic extract | Fruits | [28] Khazaelli et al. 2009 |

### Acetylcholinesterase-Inhibitory Activity

| Plant Name | Family | Type of Extract | Part Used | Reference |
|------------|--------|-----------------|-----------|-----------|
| *Brassica nigra* | Brassicaceae | Aqueous-methanolic extract | Seeds | [40] Jazayeri et al. 2014 |
| *Camellia sinensis* | Theaceae | Aqueous-methanolic extract | Leaves | [40] Jazayeri et al. 2014 |
| *Citrus aurantifolia* | Rutaceae | Aqueous-methanolic extract | Fruits | [40] Jazayeri et al. 2014 |
| *Peganum harmala L.* | Nitrariaceae | Methanolic extract, Dichloromethane extract | Seeds | [41] Adhami et al. 2011 |
| *Prangos ferulacea* | Apiaceae | n-hexane extract | Aerial parts | [42] Abbas-Mohammadi et al. 2018 |
| *Rosa damascena* | Rosaceae | Aqueous-methanolic extract | Flowers | [40] Jazayeri et al. 2014 |
| *Zizyphus vulgaris* | Rhamnaceae | Aqueous-methanolic extract | Fruits | [40] Jazayeri et al. 2014 |

### Antihyperlipidemic and Antihypertensive Activities

| Plant Name | Family | Type of Extract | Part Used | Reference |
|------------|--------|-----------------|-----------|-----------|
| *Achillea wilhelmsii C. Koch* | Compositae | Hydro-alcoholic extract | Aerial parts | [43] Asgary et al. 2000 |

### Gastric Antiulcerogenic Activity

| Plant Name | Family | Type of Extract | Part Used | Reference |
|------------|--------|-----------------|-----------|-----------|
| *Portulaca oleracea L.* | Portulacaceae | Aqueous extract Ethanol extract | Leaves | [44] Karimi et al. 2004 |

### Anti-Dyspepsia Activity

| Plant Name | Family | Type of Extract | Part Used | Reference |
|------------|--------|-----------------|-----------|-----------|
| *Mentha pulegium L.* | Lamiaceae | Hydro-alcoholic extract | Leaves | [45] Khonche et al. 2017 |

### Inhibitory Effect on Gastric Acid Output

| Plant Name | Family | Type of Extract | Part Used | Reference |
|------------|--------|-----------------|-----------|-----------|
| *Achillea wilhelmsii* | Compositae | Aqueous-ethanolic extract | Aerial parts | [46] Niazmand et al. 2010 |

### Anti-Colitic Activity

| Plant Name | Family | Type of Extract | Part Used | Reference |
|------------|--------|-----------------|-----------|-----------|
| *Rosmarinus officinalis* | Lamiaceae | Hydro-alcoholic extract and hydro-distillation (EO) | Leaves | [47] Minaiyan et al. 2011 |

#### 3.2.1. Antibacterial Activity

Abedini et al. (2014) [13] tested the antimicrobial activity of forty-four methanolic extracts, obtained from plants grown and collected in the Iranian territory, against thirty-five pathogenic bacteria and one yeast. The biological activity was evaluated with Müller–Hinton agar in Petri dishes seeded by a multiple inoculator and minimal inhibition concentration (MIC) method. The authors identified four candidates that deserve further chemical characterization and biological evaluation: *Dorema ammoniacum*, *Ferula assa-foetida*, *Ferulago contracta* (Seeds), and *Perovskia abrotanoides* (Aerial parts). These plants showed broad-spectrum activity and interesting MIC values against one or several strains (MIC = 78 μg/mL). The lowest MIC value of 78 μg/mL was achieved by *Dorema ammoniacum* against *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Staphylococcus lugdunensis*. *Ferula assa-foetida* against *Staphylococcus aureus* and *Staphylococcus epidermidis*. *Ferulago contracta* against *Staphylococcus epidermidis* [13].

Bonjar (2004) [11] evaluated the antibacterial properties of forty-five plant species used in Iranian traditional medicine practices against eleven bacterial species. The extracts were prepared by maceration of the plant material with methanol for three days, and the result was lyophilized after filtration. The lyophilized methanol extracts were diluted to a concentration of 20 mg/mL in
dimethylsulfoxide (DMSO): methanol (1/1: v/v) solvent in order to perform antimicrobial bioassay. The author declared that the following plant extracts showed broad spectra antimicrobial activity:

*Rhus coriaria* L., *Trachyspermum ammi* L., *Alhagi maurorum* Medik., *Trigonella foenum-graecum* L., *Lawsonia inermis* L., *Rheum ribes* L., and *Cuminum cyminum* L. Further studies are needed to find out which compounds are responsible for this activity. Particular plants, such as *Lawsonia inermis* L., which is active against *Pseudomonas fluorescens* and *Trachyspermum ammi* L., *Nymphaea alba* L. active against *Pseudomonas aeruginosa*, are proper candidates for further studies as possible sources of active compounds [11].

Chitsazian-Yazdi et al. (2015) [15] studied an Iranian medicinal plant known for its various biological activities, including antispasmodic and anthelmintic, named *Ferula foetida* Regel (Apiaceae).

Sulfur compounds obtained by methanolic extract of the roots of the plant were isolated and characterized to test their antimicrobial activity and cytotoxic activity. Six compounds were isolated: foetithiophene C, foetithiophene F, foetithiophene A, foetithiophene B, coniferaldehyde, and sinapic aldehyde.

Their antimicrobial activities and cytotoxicity were evaluated using broth microdilution method and Alamar blue assay. Antimicrobial activity was evidenced against Gram-positive bacteria, more in particular foetithiophene F, which showed interesting antimicrobial activity with MIC value 50 mg/mL against the Gram-positive *Bacillus cereus*. No cytotoxic activity was detected against MCF-7 and K562 cells [15].

Koochak et al. (2010) [12] conducted a preliminary study regarding the antibacterial activity of ethanolic extracts obtained by four plant species used in traditional medicinal practices in Iran. The studied plants were *Beta vulgaris* L., *Amaranthus graecizans* L., *Rumex obtusifolius* L., *Polygonum patulum* M. Bieb. The antibacterial activity was tested using the agar disc diffusion method against Gram-positive and Gram-negative bacteria. No one of the used extracts had significant antibacterial activity against Gram-negative bacteria. The highest activity was evidenced by the ethanolic extract of *Polygonum patulum* against *Streptococcus pyogenes* (inhibitory zone = 28 mm) followed by *Beta vulgaris* against *Staphylococcus epidermidis* (inhibitory zone = 23 mm) and *Rumex obtusifolius* against *Streptococcus pyogenes*. Minimum inhibitory concentration (MIC) = minimum bactericidal concentration (MBC) = 5 mg/mL. Further studies are needed to define which compounds contained in the extracts are responsible for the antimicrobial activity [12].

Lotfipour et al. (2008) [10] tested the antimicrobial activity of thirty-six extracts obtained from ten plans collected in north-west Iran against some Gram-negative strains.

Among them, the methanol extract of *Thalictrum minus* was the most active one with a minimum inhibitory concentration (MIC) value of 0.3125 mg/mL against *Staphylococcus aureus*.

Furthermore, the broad spectra of activity of some plant extracts (especially methanolic extracts) studied, obtained by the plants *Thalictrum minus, Salvia sahendica, Achillea millefolium*, and *Echium italicum*, were promising [10].

Mehdi Razavi et al. (2011) [16] tested the in vitro antimicrobial activity and cytotoxic activity of different extracts obtained by the plant *Malva sylvestris* L. (flowers and leaves); this plant is commonly used in traditional medicine practices in Iran. Flowers and leaves of the plant were collected from Tabriz, Iran. The flowers methanolic extract showed high antibacterial effects against some human pathogenic bacteria strains, such as *Staphylococcus aureus*, *Streptococcus agalactiae*, *Enterococcus faecalis*, with MIC values of 192, 200, and 256 μg/mL, respectively. Further studies are needed to identify the main active compounds [16].

Nariman et al. (2004) [18] tested the antibacterial activity of six plants collected (and endemic) in Iran, against *Helicobacter pylori*: *Glycyrrhiza aspera, Juglans regia, Ligustrum vulgare, Thymbus kotschyanus, Trachyspermum cicutum*, and *Xanthium basilicum*. A disk susceptibility assay was used for the evaluation. All of the studied extracts showed anti-*H. pylori* activity; the most active were obtained from *Xanthium basilicum* and *Trachyspermum cicutum*; the solvents used to obtain the extracts were water and an equal mixture of methanol, petroleum benzene, diethyl ether. Minimum inhibitory concentrations (MIC) of the extracts obtained from the two plants range from 31.25 to 250 μg/mL [18].
Pirbalouti et al. (2010) [17] tested the antibacterial activity of essential oils and ethanolic extracts obtained by ten plants traditionally used as medicaments grown and collected in Iran. The tested vegetal extracts were investigated against Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa, and Klebsiella pneumoniae by agar disc diffusion assay. Most of the samples showing antibacterial activity were considered as interesting by the authors against the tested bacteria with the diameter of inhibition zone ranging between 8 and 23 mm. The most interesting plants were Satureja bachtiarica and Thymus daenensis (leaves and flowers), with MIC values ranging from 0.039 to 10 mg/mL [17].

Sepahi et al. (2014) [14] tested the antibacterial activity of aqueous extracts obtained by four plants collected in Iran: Ferula gummosa, Echinophora orientalis, Nasturtium microphyllum, and Verbascum thapsus. The radial diffusion assay was performed using Staphylococcus aureus and Escherichia coli; moreover, hemolysis assay was used to test eventual toxic effects on human red blood cells. All the studied extracts showed interesting activity with MIC values lower than 750 μg/mL, and these extracts deserve further studies to identify the main active compounds [14].

3.2.2. Antifungal Activity

Imani et al. (2015) [20] studied the essential oil obtained by hydro-distillation of aerial parts of Zhumeria majdae, which is a traditionally used medicinal plant endemic in Iran. The antifungal activity was determined using the serial dilution method. The essential oil (EO) was tested on six pathogenic fungal species and one yeast, and all of them resulted as sensitive to Z. majdae essential oil. Moreover, in particular, the essential oil was interestingly effective against Candida albicans, with a MIC (minimal inhibitory concentration) of 0.031 μl/mL. This evidence confirmed the value of Zhumeria majdae as an antifungal agent, and further studies are needed to identify the compounds responsible for this biological activity [20].

In a study conducted by Pirbalouti et al. (2009) [19], the anti-Candida activity of essential oils and extracts of nine plants grown and collected in Iran was tested by agar disc diffusion assay. The studied plants are used in ethnomedical practices. Most of the tested samples showed diameters of inhibition zone ranging from 7 to 46 mm; moreover, in particular, the extracts of Ziziphus spinachristi and Scrophularia striata and the essential oil of Satureja bachtiarica showed the best anti-Candida activity, followed by the essential oils of Thymus daenensis and Trachyspermum ammi [19].

3.2.3. Antimalarial Activity

Afshar et al. (2018) [22] studied the in vitro antimalarial activity of different extracts of three Iranian endemic species belonging to the Scrophularia genus, including Scrophularia frigida, Scrophularia subaphylla, and Scrophularia atropatana. The antimalarial activity was tested by the cell-free β-hematin formation assay. Among the studied extracts, the dichloromethane one, obtained by aerial parts of Scrophularia frigida, exhibited strong antimalarial activity with inhibitory capacity (IC50) value of 0.67 ± 0.11 mg/mL. Scrophularia frigida represented a deserving candidate for further studies focused on the identification of the main active compounds [22].

Feiz Haddad et al. (2017) [21] tested the in vitro and in vivo antimalarial activity of ten Iranian plants used in traditional medicine practices. All the plants’ samples were collected in the Iranian territory. Methanolic extracts were tested for in vitro antimalarial activity against chloroquine-sensitive 3D7 and multi-drug resistant K1 strains of Plasmodium falciparum. The in vivo activity against Plasmodium berghei infection in mice was determined. Citrullus colocynthis fruits, Physalis alkekengi leaves and fruits, and Solanum nigrum fruits displayed potent in vitro antimalarial activity against both 3D7 and K1 strains; the in vivo studies comparisons between mice treated with the three plant extracts and untreated controls showed reduced parasitemia by 65.08%, 57.97%, and 60.68%, respectively [21]. Moreover, no toxicity was evidenced. Further studies can be designed to identify the active constituents and clarify their mechanism of action.
3.2.4. Antioxidant activity

Alinezhad et al. (2012) [25] tested the antioxidant activity of ethyl acetate extracts of stems and leaves and owes of the plant *Hyssopus angustifolius*, collected in Iran. Antioxidant activity of extracts was evaluated with six different tests: nitric oxide, hydrogen peroxide scavenging, 2,2-diphenyl-1-picrylhydrazyl (DPPH), metal chelating, reducing power activities, and hemoglobin-induced linoleic acid system. The results confirmed the interesting antioxidant profile of this plant; it could be a natural source of active compounds. Further studies are necessary to identify the main active compounds present in the different parts of the plant [25].

Dehghan et al. (2016) [23] evaluated the antioxidant activity and α-amylase and α-glucosidase inhibition activity of *Hyssopus officinalis* L., a medicinal herb collected from north of Iran. Total phenolic content and antioxidant activity were tested by Folin Ciocalteau and DPPH tests. Apigenin 7-D-glucosidate showed weak activity. The extract exhibited strong antioxidant activity with IC\(_50\) = 0.2 μM, a value that was interesting if compared with butylated hydroxytoluene (BHT) (IC\(_50\) = 16.7 mg/mL; used as a positive control) [23].

Dehghan et al. (2017) [24] evaluated the antioxidant and antidiabetic activity of extracts obtained by the plant *Heracleum persicum*. This work led to the isolation of eleven furanocoumarins. These compounds were identified as psoralen, bergapten, xanthotoxin, iso-pimpinellin, angelicin, isobergaptene, siphonid, pimpinellin, heratomin, 5-methoxyheratomin, moellendorfifilin, and fraxetin. As the antioxidant activity concerns, among the listed compounds, moellendorfifilin exhibited strong antioxidant activity with IC\(_50\) = 0.1 μM; used as a positive control) [24].

Ebrahimabadi et al. (2010) [30] tested the antioxidant activity of polar and non-polar fractions of the methanolic extract obtained by the plant *Stachys inflata*. Aerial parts of the plant were collected from Kashan area, Isfahan province, Iran. The biological activity was tested using 2,2-diphenyl-1-picrylhydrazyl (DPPH) and β-carotene/linoleic acid assays. In the DPPH test, interesting results were shown by the methanolic extract polar subfraction with an IC\(_50\) of 89.50 μg/mL, indicating an antioxidant potency of about 22% of that of butylated hydroxytoluene (IC\(_50\) = 19.72 μg/mL). In β-carotene/linoleic acid assay, the best inhibition belonged to the nonpolar subfraction, with an inhibition percentage of 77.08%. Further studies are needed to identify the main active compounds [30].

Fatihiazad et al. (2011) [26] studied the ethyl acetate and n-butanol extracts obtained by aerial parts of the plant *Hyssopus officinalis* L., a medicinal herb collected from north of Iran. Total phenolic content and antioxidant activity were tested by Folin–Ciocalteau and DPPH tests. Apigenin 7-O-β-D-glucuronide was also isolated as the major flavon. Phenolic content of n-butanol and ethyl acetate extracts was determined and expressed as milligrams of gallic acid equivalents—246 mgGAE/g and 51 mg GAE/g, respectively. The antioxidant activity of apigenin 7-O-β-D-glucuronide, ethyl acetate extract, and the n-butanol extract was determined, obtaining IC\(_50\) values of 116×10\(^{-3}\), 103×10\(^{-3}\), 25×10\(^{-3}\) mg/mL, respectively. The purified apigenin 7-O-β-D-glucuronide showed weak activity. The extract that showed interesting antioxidant activity values, because of the highest content of total phenolic compounds, was the n-butanol one [26].

Khazaei et al. (2009) [28] tested five traditional medicinal plants from Iran on free radicals scavenging activity and on the inhibition of mushroom tyrosinase activity. Focusing on the radical scavenging activity, methanolic extracts of *Quercus infectoria* and *Terminalia chebula* showed a strong radical scavenging effect in the 2,2′-diphenyl-1-picrylhydrazyl (DPPH) assay with values of IC\(_50\) (concentration providing 50% inhibition of the DPPH radical) of 15.3 and 82.2 μg/mL, respectively. This study encouraged further investigations on *Quercus infectoria* and *Terminalia chebula* in the field of solar protection (due to the radical scavenging activity) and of skin depigmentation agents (due to inhibitory effects on mushroom tyrosinase) [28].

Dehshiri et al. (2013) [31] tested the antioxidant activity of laminas, stems, petioles, fruits, peduncles, and flowers in the hydro-alcoholic extracts from the plant *Tetraenaemium lasiopetalum*. The
plant samples were collected from Oshtoran Kuh, Azna, Lorestan, Iran. Antioxidant activities of the extracts were examined by different in vitro assays: 2,2′-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, metal chelating, reducing power activities, and hemoglobin-induced linoleic acid system. All the tested extracts showed interesting antioxidant activity, confirming hypotheses based on traditional knowledge. Moreover, in particular, the hydro-alcoholic extract of the flower showed the highest activity in the DPPH test (IC₅₀ = 170 ± 7 μg/mL). In the metal chelating assay, lamina extract showed the best iron ion chelating activity among the other extracts (IC₅₀ = 230 ± 10 μg/mL). Lamina hydro-alcoholic extract demonstrated better activity in the hemoglobin-induced linoleic acid system test than other parts of T. lasiopetalum [31]. Further studies could identify the main active compounds.

Pourmorad et al. (2006) [27] worked on the antioxidant activity, phenol, and flavonoid content of five plants (Mellilotus officinalis, Equisetum maximum, Plantago major, Adiantum capillus-veneris, and Urtica dioica) collected from Northern provinces of Iran (Gilan and Mazandaran). Methanolic extraction was performed after drying at room temperature, and the result was freeze-dried. The extract of Mellilotus officinalis showed a high amount of flavonoid (57 ± 5.4 mg/g) and phenolic compounds (289.5 ± 5 mg/g) and exhibited the greatest radical scavenging activity (IC₅₀ = 0.018 mg/mL) in a DPPH test among the tested extracts [27].

Sonboli et al. (2010) [29] assessed antioxidant activities and total phenolic contents of methanolic extracts obtained from male inflorescences of Salix aegyptiaca L., grown and collected in Ashena Abad village, Urmia (West Azarbajian province), Iran. 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay and Folin–Ciocalteu method were performed on the whole methanolic extract and on three fractions (water fraction, butanol fraction, and chloroform fraction) obtained from it. The butanol fraction evidenced, among the others, the best antioxidant activity and the highest phenolic content with an IC₅₀ value of 27.7 μg/mL and total phenols of 313.8 ppm; the results were interesting because this extract was comparable with the synthetic antioxidant butylated hydroxytoluene (BHT) (IC₅₀ = 26.5 μg/mL) [29]. The detected antioxidant activity encouraged the use of this plant for its antioxidant properties in food industries and in cosmetic and pharmaceutical preparations.

3.2.5. Anticancer Activity/Cytotoxic Activity

Asadi-Samani et al. (2018) [33] tested the in vitro antiproliferative activity of twenty Iranian medicinal plants against prostate cancer. The plant samples were collected in Chaharmahal and Bakhtiari provinces, Iran. The extraction of the powdered aerial parts was conducted by maceration in ethanol 70% for 72 h and was concentrated under reduced pressure. Antiproliferative activity of the tested extracts on PC-3, DU145 (prostate cancer cell lines), and HDF (non-cancer cell line) cell lines was evaluated by MTT (3-[4,5-dimethylthiazol-2-yl]-2,5 diphenyl tetrazolium bromide) assay. The hydro-alcoholic extract obtained by the plant Euphorbia szovitsii Fisch. & C. A. Mey showed good antiproliferative activity against PC-3 and DU145 cell lines. Urtica dioica and Medicago sativa resulted active only on the DU-145 cell line. These results could be a starting point in the development of new anticancer drugs, and further studies are needed in order to identify the main active compounds [33].

Esmaeielbeig et al. (2015) [36] tested the in vitro anticancer activities of ten species of plants grown and collected in southern Iran using the MTT colorimetric assay. Methanolic extracts obtained by aerial parts of the plants Arctium lappa, Cichorium intybus, Glycyrrhiza glabra, Allhagi psuedalhahi, Mentha longifolia, Thymus daenensis, Thymus vulgaris, Satureja bachtiarica, Satureja hortensis, and Rheum ribes were tested against five tumor cell lines: K562 (myelogenous leukemia), Jurkat (T cell leukemia), and Raji (Burkitt’s lymphoma), Fen (bladder carcinoma), and HeLa (human cervical epithelioid carcinoma). No activity was detected against solid tumor cell lines Fen and HeLa, and leukemic cell lines demonstrated to be more sensitive to the extracts. Satureja hortensis, Satureja bachtiarica, Thymus vulgaris, Thymus daenensis, and Mentha longifolia showed strong inhibitory activity on Jurkat cells with inhibition values higher than 80% at a concentration of 200 μg/mL. At the same concentration, these extracts inhibited the K562 cell line with more than 50% of inhibition [36]. Further studies are needed to identify the main active compounds.

Hamzeloo-Moghadam et al. (2015) [35] tested the cytotoxic activity and the apoptosis induction activity of different fractions obtained by methanolic extract of Hypericum scabrum leaves. The plant
was collected from Alborz province, Iran. The petroleum ether, dichloromethane, and methanol fractions were evaluated for cytotoxicity against M-CF7, A-549, HT-29, and HepG-2 cell lines. The apoptosis induction ability was assessed by activated caspase-3 inspection and Annexin V FITC/PI (propidium iodide) assays.

The results evidenced strong cytotoxicity against HT-29 and HepG-2 cell lines and interesting apoptosis induction ability; the authors suggested further studies in this field [35].

Jassbi et al. (2016) [32] tested the cytotoxic activity, against three human cancer cell lines (LS180, MCF-7, and MOLT-4), of dichloromethane and methanol extracts of Anthemis mirheydari, an endemic plant from Iran. The plant samples were collected in Jahrom in Fars province, Iran, and the whole plant was used for the extraction. The dichloromethane extract evidenced interesting IC50 values, 30.8, 25.2, and 8.6 mg/mL for the three cell lines, respectively. Four compounds were isolated from the dichloromethane extract: taraxasterol, pseudotaraxasterol, β-sitosterol, and 7-methoxycoumarin. Taraxasterol and 7-methoxycoumarin are known in scientific literature to present anticancer properties; this fact, along with the encouraging results of the study, makes Anthemis mirheydari a new potential anticancer medicinal plant that certainly deserves further investigations [32].

Mehdi Razavi et al. 2011 [16] tested the in vitro cytotoxic activity of different extracts obtained by the plant Malva sylvestris L. (flowers and leaves); this plant is commonly used in traditional medicine practices in Iran. Flowers and leaves of the plant were collected from Tabriz, Iran. The methanolic extracts of flowers and leaves evidenced interesting cytotoxic activity against the MacCoy cell line, reducing their viability with IC50 values of 265.3 and 311.0 μg/mL, respectively. The authors declared that Malva sylvestris L. plant extracts could be considered as an antiproliferative agent [16]. Further studies are needed to identify the main active compounds.

Sahranavard et al. (2009) [34] tested the cytotoxic activity of methanolic extracts of fifteen Iranian medicinal plants against three cancer cell lines (MCF7, HepG2, WEHI164). The extract obtained by Ferula szowitsiana root showed IC50 values lower than 100 μg/mL in all the tested cell lines, and it was chosen for further studies. Fractionation was performed, which led to the isolation of two monoterpenoids; both of them were bornyl esters that were identified as Chimganin and Chimgin. These compounds showed interesting cytotoxic effects with values of IC50 significantly lower if compared to the whole extract; they performed a little less than tamoxifen, which was used as a positive control. These results demonstrated that the two compounds were mostly responsible for the cytotoxic activity of this plant [34].

3.2.6. Antidiabetic Activity

Dehghan et al. (2016) [23] evaluated α-amylase and α-glucosidase inhibition activities of n-hexane, ethyl acetate, and methanol extracts obtained by various parts of eleven plants grown and collected in Hycran region, Iran.

The n-hexane extract of Heracleum persicum (aerial parts, roots), ethyl acetate and n-hexane extract of Smilax excelsa (stem and leaves), methanolic, n-hexane, ethyl acetate extract of Pyrus boissieriana (leaves and steam), ethyl acetate and methanolic extract of Parrotia persica (leaves), and methanolic and ethyl acetate extract of Primula heterochroma (leaves and roots) exhibited significant antidiabetic activities in α-glucosidase and α-amylase assays, more effective than acarbose used as a positive control [23]. These plants, in conclusion, are deserving candidates for further studies in the antidiabetic field.

Dehghan et al. (2017) [24] evaluated the antidiabetic activity of extracts obtained by the plant Heracleum persicum. This work led to the isolation of eleven furanocoumarins. These compounds were identified as psoralen, bergapten, xanthotoxin, iso-pimpinellin, angelicin, isobergapten, spsodin, pimpinellin, heratomin, 5-methoxyheratomin, moellendorffline, and fraxetin. Among them, moellendorffline showed significant inhibitory activity against α-glucosidase with an IC50 value of 17.9 nM, and it was more active than acarbose (IC50 = 23.5 nM; used as a positive control) [24].

Hasanein et al. (2016) [37] studied the effects of Salvia officinalis L. against learning and memory deficit induced by diabetes. This plant has been used in Iranian traditional medicine practices against
diabetes. The plant samples were collected in Hamedan, Iran. The effects of the leaves’ hydroalcoholic extract on passive avoidance learning (PAL) and memory in streptozocin-induced diabetic and non-diabetic rats were evaluated. Administration for thirty days demonstrated to alleviate the negative influence of diabetes on learning and memory. Positive effects on hyperglycemia and oxidative stress were evidenced. Therefore, Salvia officinalis L. and its constituent rosmarinic acid represented a potential therapeutic option against diabetic memory impairment, and further studies are needed to clarify the mechanisms involved in this activity [37].

3.2.7. Iron chelating activity

Ebrahimzadeh et al. (2008) [38] tested the iron chelating activity, phenol, and flavonoid content of eleven medicinal plants from Iran. The extraction was performed by maceration of the vegetal dried material for three days. The solvent was evaporated under reduced pressure and then lyophilized. Epilobium hirsutum leaves and Melilotus arvensis showed the best chelating activity with IC₅₀ values of 0.49 ± 0.01 mg/mL and 0.08 ± 0.01 mg/mL, respectively. These plant extracts also showed high phenol and flavonoid contents. Feijoa sellowiana leaves and Pistacia lentiscus showed good chelating activity [38].

3.2.8. Anti-platelet aggregation activity

Lorigooini et al. (2014) [39] studied the essential oil obtained by aerial parts of Allium atrovio laceum. The plant was collected in Rig mountain, Shahr-e-kord province, Iran. In this work, the anti-platelet aggregation activity of the essential oil was examined using arachidonic acid (AA) and adenosine diphosphate (ADP) as platelet aggregation inducers.

The essential oil evidenced dose-dependent inhibitory effect against AA and ADP-induced aggregation with IC₅₀ values of 0.25 mg/mL and 0.47 mg/mL, respectively [39]. Further studies are required to identify the main active compounds of the essential oil.

3.2.9. Mushroom tyrosinase inhibition activity

Khazaeli et al. (2009) [28] tested five traditional medicinal plants from Iran on the inhibition of mushroom tyrosinase activity. Methanolic extracts obtained from Quercus infectoria galls and Terminalia chebula fruits showed inhibitory effects on mushroom tyrosinase in the hydroxylation of L-tyrosine (85.9% and 82.2% of inhibition, respectively). Furthermore, these two plants inhibited the oxidation of Levodopa (L-DOPA), performing similarly to kojic acid (used as a positive control) with values of IC₅₀ = 102.8 and 192.6 μg/mL, respectively [28]. This study encouraged further investigations on the two plants in the field of solar protection due to the radical scavenging activity and of skin depigmentation agents due to inhibitory effects on mushroom tyrosinase.

3.2.10. Acetylcholinesterase-Inhibitory Activity

Abbas-Mohammadi et al. (2018) [42] tested the acetylcholinesterase-inhibitory activity of n-hexane, ethyl acetate, and methanolic extracts obtained by aerial parts of twenty-five plants grown and collected in Iran. The evaluation was conducted by an in vitro enzymatic Ellman method and molecular docking study. The n-hexane extract obtained by the plant Prangos ferulacea showed the highest acetylcholinesterase (AChE)-inhibitory activity with 75.6% inhibition at a concentration of 50 μg/mL. The chemical characterization of the extract led to the identification of seventeen compounds. Further studies led to the identification of a subfraction (named F₁₀) that resulted as the most potent inhibitor of AChE in this extract with an IC₅₀ value of 25.2 μg/mL [42]. Prangos ferulacea deserves further in vivo and in vitro studies as the discovery of new acetylcholinesterase (AChE) inhibitors might lead to new tools for the treatment of Alzheimer’s disease.

Adhami et al. (2011) [41] tested the acetylcholinesterase-inhibitory activity of forty herbal drugs traditionally used against cognitive disorders in Iran. Eighty drugs were tested by TLC bioautography method and microplate colorimetric assay, and, due to the interesting activity, the
seeds of *Peganum harmala* L. were investigated in detail. The alkaloids harmaline and harmine were identified as active compounds. The IC₅₀ values were 8.4 μg/mL for harmaline (pure compound) and 10.9 μg/mL for harmine (pure compound), 41.2 μg/mL for the methanolic extract, 95.5 μg/mL for the dichloromethane extract [41]. The two tested alkaloids were the major AChE-inhibitory compounds in *Peganum harmala*; this plant deserves further studies to test the biological activity in vivo.

Jazayeri et al. (2014) [40] evaluated the acetylcholinesterase-inhibitory activity of eighteen aqueous-methanolic extracts (1:1 v/v) obtained by plants commonly used in Iranian traditional medicine collected in Tehran. The inhibitory activity was tested using the in vitro Ellman spectrophotometric method. According to the results, five plants evidenced interesting properties. The inhibitory activity values, expressed as IC₅₀ μg/mL, in fact were 5.96 μg/mL for *Camellia sinensis* (leaves), 19.57 μg/mL for *Citrus aurantifolia* (fruits), 24.37 μg/mL for *Zizyphus vulgaris* (fruits), 84.30 μg/mL for *Brassica nigra* (seeds), and 93.1 μg/mL for *Rosa damascena* (flowers) [40]. Further investigations regarding the identification of active components in the extracts are needed.

### 3.2.11. Antihyperlipidemic and Antihypertensive Activities

Aşgary et al. (2000) [43] studied the antihyperlipidemic and antihypertensive effects of *Achillea wilhelmsii* C. Koch drops, with a double-blind placebo-controlled clinical trial. The aerial parts of the plant were collected in Chatrood village in the province of Kerman, Southeast Iran. Moderate hyperlipidemic and primary hypertensive subjects were treated with a hydro-alcoholic extract twice daily for more than six months. The results showed a significant decrease in triglycerides after two months of treatment. Significant decreases in triglycerides, total cholesterol, and low-density lipoproteins (LDL)-cholesterol were observed after four months of treatment. Levels of high-density lipoproteins (HDL)-cholesterol were significantly increased after six months. A significant decrease in diastolic and systolic blood pressure was observed after two and six months, respectively [43].

### 3.2.12. Gastric Antiulcerogenic Activity

Karimi et al. (2004) [44] studied the gastric antiulcerogenic activity of aqueous and ethanolic extracts obtained from the plant *Portulaca oleracea* L. collected in the village of Khaje-rabi, Khorasan province, Iran. Both leaves extracts, tested in vivo in mice, showed remarkable dose-dependent inhibition of gastric lesions induced by absolute ethanol or HCl [44]. This gastroprotective activity resulted in line with Iranian traditional medicine knowledge, and it deserves further studies to determine the involved mechanisms.

### 3.2.13. Anti-Dyspepsia Activity

Khonche et al. (2017) [45] tested the efficacy of *Mentha pulegium* L., collected in the Alborz province of Iran, against functional dyspepsia in a randomized double-blind placebo-controlled clinical trial. Leaves of this plant are used in Iranian traditional medicine practices to treat dyspeptic symptoms. The hydro-alcoholic leaf extract taken daily for two months was shown to be effective in the reduction of dyspeptic symptoms, improving quality of life, and contributing to eradicate *Helicobacter pylori* in patients affected by functional dyspepsia [45].

### 3.2.14. Inhibitory Effect on Gastric Acid Output

Niazmand et al. (2010) [46] studied the effects of the aqueous-ethanolic extract obtained by aerial parts of the plant *Achillea wilhelmsii* on rat’s gastric acid output in basal, vagotomized, and vagal-stimulated conditions. The plant samples were collected from South Khorasan province, Iran. *Achillea wilhelmsii* is a plant frequently used in Iranian traditional medicine against gastrointestinal disorders. The results of the in vivo study showed that the aqueous-ethanol extract of *A. wilhelmsii* exhibited an inhibitory effect on gastric acid output in basal conditions via the gastric parasympathetic nerve. The extract had no effect on vagal-stimulated conditions [46]. Further studies are needed to identify the compounds and mechanisms responsible for this activity.
3.2.15. Anti-Colitic Activity

Minaiyan et al. (2011) [47] tested the anti-colitic activity of hydro-alcoholic extract and the essential oil obtained by *Rosmarinus officinalis* leaves. The plant material was collected in the city of Isfahan, Iran. The study was performed in vivo on a model of experimental colitis induced by trinitrobenzene sulfonic acid in rats.

Both the extracts at all the tested doses demonstrated to be effective in the reduction of colon tissue lesions and of colitis indices; the higher doses tested were considerably effective in diminishing histopathologic parameters. These data supported the traditional medicine knowledge and suggested that both hydro-alcoholic extract and the essential oil obtained by *Rosmarinus officinalis* leaves possess consistent anti-colitic activity [47].

4. Conclusions

The Iranian territory possesses a great abundance of plants suitable for medicinal use and remarkable heritage of knowledge handed down from generation to generation concerning natural remedies against a wide range of diseases and disorders. Nowadays, the study of this heritage is at an early stage.

As reported in sections 3 and 4, the bibliographic research evidenced ethnobotanical studies conducted in the Iranian territory, carrying out questionnaires and interviews with traditional healers or local people, and scientific studies inspired by traditional medicinal practices conducted on plants collected in Iran. Comparing ethnobotanical studies and traditional medicine-inspired scientific studies, it is evident that most of the Iranian traditional herbal remedies have not been considered from a scientific point of view yet. Only 34 plants are cited in both sections 3 and 4 among the 245 of section 3. Table 3 provides a comparison between traditional uses and tested biological activities of the plants cited both in sections 3 and 4.

### Table 3. Comparison between traditional uses and tested biological activities of Iranian plants.
(N.r. = not reported).

| Plant Name | Family            | Traditional Uses                                                                 | Biological Activities                                      |
|------------|-------------------|----------------------------------------------------------------------------------|------------------------------------------------------------|
|            |                   | Part of the Plant (When Reported)                                                | Part of the Plant                                           |
|            |                   | Type of Extract (When Reported)                                                  | Type of Extract (When Reported)                            |
|            |                   | Authors                                                                          | Authors                                                    |
| **Achillea millefolium** | Asteraceae | Antidiabetic                                                                    | Antibacterial activity                                     |
| **L.**     |                   | Inflorescence                                                                    | Aerial parts                                               |
|            |                   | Boiled, Steamed                                                                  | Methanolic extract                                         |
|            |                   | [7] Bahmani et al. 2014                                                          | [10] Lotfipour et al. 2008                                 |
|            |                   | Antiparasitic                                                                    |                                                            |
|            |                   | Aerial parts                                                                     |                                                            |
|            |                   | [6] Bahmani et al. 2016                                                          |                                                            |
|            |                   | Herbal tea/decocction                                                            |                                                            |
| **Alhagi maurorum** | Fabaceae | Appetite suppressant, Diuretic, Jaundice, Febriuge | Antibacterial activity                                     |
|            |                   | Aerial parts, Manna                                                             | Leaves                                                    |
|            |                   | [5] Amiri and Joharchi 2013                                                      | Methanolic extract (Lyophilized)                           |
|            |                   |                                                                                | [11] Bonjar et al. 2004                                   |
| **Brassica nigra (L.)** | Brassicaceae | Laxative                                                                         | Acetylcholinesterase-inhibitory activity                    |
|            |                   | Seeds                                                                            | Seeds                                                     |
|            |                   | [5] Amiri and Joharchi 2013                                                      | Aqueous-methanolic extract                                |
|            |                   |                                                                                | [40] Jazayeri et al. 2014                                  |
| **Camellia sinensis (L.)** | Theaceae | Obesity, Anticancer, Antihypertensive, Hepatitis, Antihyperlipidemia | Acetylcholinesterase-inhibitory activity                    |
|            |                   | Leaves                                                                          | Leaves                                                    |
|            |                   | [5] Amiri and Joharchi 2013                                                      | Aqueous-methanolic extract                                |
|            |                   |                                                                                | [40] Jazayeri et al. 2014                                  |
| Species | Family | Activities | Products | References |
|---------|--------|------------|----------|------------|
| *Citrullus colocynthis* (L.) Cucurbitaceae | | Antidiabetic Fruit | Purgative, Anodyne, Hypoglycemic Fruit-Seed | [7] Bahmani et al. 2014 [5] Amiri and Joharchi 2013 |
| *Citrus aurantiifolia* Rutaceae | | Antihypertensive, Calmative Fruit | | [5] Amiri and Joharchi 2013 |
| *Cuminum cyminum* L. Apiaceae | | Treatment of colic, Galactogogue, Obesity, Digestive, Flavoring, Antiseptic Fruit | | [5] Amiri and Joharchi 2013 |
| *Dorema ammoniacum* Apiaceae | | Cystitis, Digestive, Treatment of colic, Treatment of furuncles, Expectorant, Anthelmintic, Emmenagogue, Anticoagulation Gum-Root | | [5] Amiri and Joharchi 2013 |
| *Ferula assa-foetida* L. Umbelliferae | | Antiparasitic Leaf Herbal tea/decoction | | [6] Bahmani et al. 2016 [5] Amiri and Joharchi 2013 |
| *Ferula foetida* Apiaceae | | Anthelmintic, Treatment of colic, Emmenagogue Gum | | [5] Amiri and Joharchi 2013 |
| *Ferula gummosa* Apiaceae | | Anthelmintic, Anticatarrhal, Anti-allergic, Dyspepsia, Appetizer, Emmenagogue Gum-Root | | [5] Amiri and Joharchi 2013 |
| *Heracleum persicum* Apiaceae | | Stomach ache Leaf, Flower Decoction | | [8] Delfan et al. 2015 [24] Dehghan et al. 2017 |
| *Hypericum scabrum* L. Hypericaceae | | Antimigraine, Gastric ulcer, Anti-hemorrhage, Urinary incontinence, Treatment of headache Flower | | [5] Amiri and Joharchi 2013 |

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| Plant Name | Scientific Name | Family | Common Names | Active Constituents | Active Constituents Literature |
|------------|-----------------|--------|--------------|---------------------|---------------------------------|
| *Lawsonia inermis* L. | *Lawsonia inermis* L. | Lythraceae | Hair color, Treatment of headache, Hair tonic, Washing, Antifungal, Antiseptic | Antimicrobial activity | [35] Hamzeloo-Moghadam et al. 2015 |
| *Malva sylvestris* L. Var. | *Malva sylvestris* L. | Malvaceae | Hair color, Treatment of headache, Hair tonic, Washing, Antifungal, Antiseptic | Antimicrobial activity | [16] Razavi et al. 2011 |
| *Medicago sativa* L. | *Medicago sativa* L. | Fabaceae | Appetizer, Tonic, Osteomalacia, Anti-hemorrhage, Febrifuge, Antitussive, Calmative, Digestive, Aerial parts | Antiproliferative activity on DU-145 cell line | [36] Esmaeilbeig et al. 2015 |
| *Mentha longifolia* Lam. | *Mentha longifolia* Lam. | Lamiaceae | Herpes, Anthelmintic, Antacid, Carminative, Antidiarrhea, Digestive | Anticancer activity | [33] Asad-Samani et al. 2018 |
| *Nymphaea alba* L. | *Nymphaea alba* L. | Nymphaeaceae | Expectorant, Hypnotic, Antitussive, Calmative | Antimicrobial activity | [11] Bonjar et al. 2004 |
| *Peganum harmala* L. | *Peganum harmala* L. | Nitrariaceae | Diabetes, Antiseptic, Hypnotic, Treatment of rheumatism and sciatica disorders, Anthelmintic | Acetylcholinesterase-inhibitory activity | [41] Adhami et al. 2011 |
| *Perovskia abrotanoides* Kar. | *Perovskia abrotanoides* Kar. | Lamiaceae | Treatment of sinusitis, Treatment of toothache, Antitussive, Nerve tonic, Carminative, Sedative, Antiseptic, Anthelmintic, Treatment of colic | Antimicrobial activity | [13] Abedini et al. 2014 |
| *Physalis alkekengi* L. | *Physalis alkekengi* L. | Solanaceae | Emmenagogue, Treatment of kidney stones, Blood cleansing, Fruit | Antimalarial activity | [21] Feiz Haddad et al. 2017 |
| *Portulaca oleracea* L. | *Portulaca oleracea* L. | Portulacaceae | Antitussive, Febrifuge, Anti-thirst, Food digestion, Depurative, Diuretic, Ant-hemorrhoids | Gastric antulcerogenic activity | [44] Karimi et al. 2004 |
| *Quercus infectoria* Oliv. | *Quercus infectoria* Oliv. | Fagaceae | Nosebleed, Anti-hemorrhage, Uterus ailments, Mouth wounds, Anti-hemorrhoids, Insect gull | Radical scavenging activity | [28] Khazaeli et al. 2009 |
| Common Name                  | Scientific Name      | Family              | Uses                                                                 | Methods                                                                 |
|-----------------------------|----------------------|---------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------|
| *Rheum ribes* L. Polygonaceae | Jaundice, Urinary antiseptic, Diuretic, Depurative, Liver tonic, Antiseptic, Hair tonic Fruit-Petiole | | Antibacterial activity                                                   | Leaves, Methanolic extract (Lyophilized) | [5] Amiri and Joharchi 2013 [11] Bonjar et al. 2004 |
| *Rhus coriaria* L. Anacardiaceae | Jaundice, Cholesterol-lowering, Diabetes, Antihypertensive, Antidiarrhea, Anti-hemorrhage, Flavouring | | Antibacterial activity                                                   | Leaves, Methanolic extract (Lyophilized) | [5] Amiri and Joharchi 2013 [11] Bonjar et al. 2004 |
| *Rosa damascena* Mill. Rosaceae | Anti-hemorrhoid, Laxative, Calmative Flower | | Acetylcholinesterase-inhibitory activity                               | Flowers, Aqueous extract and methanolic extract | [5] Amiri and Joharchi 2013 [40] Jazayeri et al. 2014 |
| *Salix aegyptiaca* L. Salicaceae | Calmative, Cardiac tonic, Painful menstruation Flower | | Antioxidant activity, Anticancer activity                              | Male inflorescences, Methanolic extract | [5] Amiri and Joharchi 2013 [29] Sonboli et al. 2010 |
| *Satureja hortensis* L. Lamiaceae | Indigestion, Anthelmintic, Appetizer, Antacid, Antidiarrhea Aerial parts | | Anticancer activity                                                    | Aerial parts, Methanolic extract | [5] Amiri and Joharchi 2013 [36] Esmaeilbeig et al. 2015 |
| *Scrophularia striata* Scrophulariaceae | Kidney troubles, Antidiarrhoea, Treatment of colic, Carminative, Treatment of joints pain Aerial parts | | Antibacterial activity                                                 | Leaves and stems, Infusion | [5] Amiri and Joharchi 2013 [19] Pirbalouti et al. 2009 |
| *Thymus daenensis* Lamiaceae | Stomach ache Flower, Leaf, Branch Decoction | | Anti-Candida activity                                                   | Leaves, Hydro-distillation and ethanolic extract | [8] Delfan et al. 2015 |
| *Trachyspermum ammi* L. Apiaceae | Carminative, Anthelmintic, Antidiarrhoea, Treatment of colic, Antacid, Galactogogue Fruit | | Antibacterial activity                                                 | Leaves, Methanolic extract (Lyophilized) | [5] Amiri and Joharchi 2013 [11] Bonjar et al. 2004 |
|                              |                      |                     |                                                                      | Anticancer activity                                                    | [5] Amiri and Joharchi 2013 [36] Esmaeilbeig et al. 2015 |
|                              |                      |                     |                                                                      | Aerial parts, Methanolic extract | [5] Amiri and Joharchi 2013 [19] Pirbalouti et al. 2009 |
|                              |                      |                     |                                                                      | Antibacterial activity                                                 | Leaves, Methanolic extract (Lyophilized) | [11] Bonjar et al. 2004 |
|                              |                      |                     |                                                                      | Anticancer activity                                                    | Leaves, Methanolic extract (Lyophilized) | [5] Amiri and Joharchi 2013 [19] Pirbalouti et al. 2009 |
| Plant Common Name                  | Scientific Name | Family       | Medicinal Uses                                                                 | Scientific Activities                          | References                          |
|----------------------------------|-----------------|--------------|-------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------|
| *Trigonella foenum-graecum* L.   | Fabaceae        |              | Diabetes, Bronchitis, Osteomalacia, Antihyperlipidemia, Tonic, Treatment of anemia Seed | Antibacterial activity                        | [5] Amiri and Joharchi 2013         |
|                                  |                 |              |                                                                                | Leaves                                       | [11] Bonjar et al. 2004             |
| *Urtica dioica* L.               | Urticaceae      |              | Hypoglycemic, Enlarged prostate, Anemia, Anti-inflammatory, Digestive Whole plant | Antiproliferative on DU-145 cell line         | [5] Amiri and Joharchi 2013         |
|                                  |                 |              |                                                                                | Aerial parts                                 | [33] Asadi-Samani et al. 2018       |
| *Ziziphus spina-christi*          | Rhamnaceae      |              | Stomach ache, Flower, Leaf, Decoction, Eczema, Hair tonic, Antifungal, Antipruritic, Washing | Anti-Candida activity                        | [8] Delfan et al. 2015            |
|                                  |                 |              |                                                                                | Fruits                                       | [19] Pirbalouti et al. 2009         |

The identification of a direct correspondence between the traditional uses and biological activities represents a complex issue. Some plant species mentioned in this work have already been studied in other parts of the world with different climatic characteristics and, consequently, different phytocomplexes. In our opinion, it is of interest to study plants that are not interesting from a medicinal point of view in other parts of the world if included in traditional medicinal practices in Iran, as they could be active due to a quite different phytocomplex expressed in the particular climatic characteristics and ecosystems of the Iranian territory. It should be pointed out that, considering the research works found in literature, the process of valorization and study of plant species does not often pay particular attention to the aspect of sustainability of eventual systematic exploitation. This aspect is becoming more and more important these days.

Traditional remedies are often effective due to the synergistic activity of a large number of compounds that are part of the plant phytocomplex; therefore, careful research is needed to identify the active molecules. The research work is further complicated by the fact that in some cases, natural remedies act as palliatives. In any case, the evidence that nature has always inspired medicine, constituting itself as a source of inspiration for the development of pharmacological treatments, makes the study of traditional remedies a very important component of basic research in the medicinal and pharmacological field.

A summary of the information in the scientific literature, related to documented traditional medicinal practices and plants studied from a scientific point of view in the same territory, represents a useful tool to plan new researches in order to avoid repeating work already done and to concentrate on apparently effective but not yet scientifically evaluated plants. In our opinion, there is still a large room for scientific works that could deepen the above-stated aspects, encouraging further research in the field.

**Author Contributions:** Conceptualization, S.M. and H.R.A.; methodology, S.V.; validation, S.V., A.B.; investigation, P.B., R.B., S.S.; resources, S.M.; data curation, P.B.; writing—original draft preparation, P.B.; writing—review and editing, P.B.; supervision, S.M., H.R.A.; project administration, S.V.; funding acquisition, S.M. All authors have read and agreed to the published version of the manuscript.

**Funding:** The present work has been financially supported by the Ministry of Education and Research (MIUR) of Italy (PRIN: 2017E84AA4_002).

**Acknowledgments:** The technical support of Dr. Elisa Durini is gratefully acknowledged.

**Conflicts of Interest:** The authors state no conflict of interest.
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