An Encyclopedia of Herb-Disease, a Quick Shortcut for Herbal Research: A Comprehension Based on Iranian Herbal Studies

Abstract
The use of herbal medicine has been faced with a huge welcome by patients and scientists, as well as drug industries. It seems that reducing the time of research, economizing investments with better safety, and conducting high-quality botanical research are essential and indispensable. This study aimed to introduce the first reciprocal herb-disease encyclopedia and to recount some of the salient points of herbal research based on Iranian studies. A search limited to Iran was conducted using 36 search terms in the data banks Pubmed, Scopus, ScienceDirect, Wiley, and SpringerLink up to the end of 2012. Data including the investigated disease(s) and common and scientific names of the investigated herbs were extracted from the titles and abstracts of 1310 articles. Investigated subjects and diseases have been categorized in 18 groups: cancer, cardiovascular, cellular-molecular, embryology, endocrinology, genito-urology, gastrointestinal, gynecology, immunology, infectious, metabolism, mucocutaneous, musculoskeletal, neuroscience, ophthalmology, renal, reproductive, and respiratory topics. Herbs including Crocus sativus L., Allium sativum L., and Zataria multiflora Boiss from totally 560 studied herbs were the most studied ones. Only 69 of 560 studied (12.5%) herbs were endemic to Iran. Due to the vast majority of information available for herbs and diseases, an herb-disease encyclopedia comes to the help of herbal researchers and enthusiasts to find that which herb is useful or recommended for which kind(s) of health problems, and/or for the management, pretreatment or treatment of a specific disease or disorders.

Keywords: Encyclopedia; Herbal medicine; Traditional medicine; Research; Iran

Introduction
The use of medicinal plants in therapy has been known for centuries in every culture and civilization [1,2]. Traditional medicine is an important part of human health care and there is an increasing worldwide demand for botanicals in all countries [1,3]. In other words, patients desire to benefit from the use of complementary and alternative medicine (CAM) such as herbal medicine. However, sometimes they are not informed that herbal therapy, especially over a proven conventional therapy, may be toxic and dangerous [4]. In order to decrease this kind of risks, clinicians and pharmacists need to be informed about herbs and other CAM practices [5,6], especially with their own country endemic, traditional herbs [7].

On the other hand, the drug discovery process is becoming extremely expensive for the pharmaceutical industry. Natural drug discovery based on ethnopharmacology and traditional medicines is becoming an attractive area [8]. Medicinal herbs and related herbal products are important targets of patent claims since they have become of great interest to the international drug and cosmetic industry [1]. However, there are many problems associated with botanicals research, for instance limited data exist on the safety and efficacy of botanical products [7,9]. Therefore, reducing the time of research, economizing investments with better safety and conducting high-quality botanicals research are essential and indispensable. To do this, a quick access to valid information is requisite.
The aim of this article is to introduce a framework for a compendious and reciprocal encyclopedia of herb-disease based on Iranian herbal studies. Such an encyclopedia helps researchers and enthusiasts on herbal medicine to find out that the effects of an herb have been investigated on the treatment of which kind of disease or the management of a particular disease has been examined using which herbs, in a shortest possible time.

Materials and Methods

This review is based on Winslow et al. [4] and WHO [10] definition of herb. A search limited to Iran was conducted using 36 search terms listed in Table 1 in the data sources PubMed, Scopus, ScienceDirect, Wiley, and SpringerLink up to the end of 2012.

Inclusion and exclusion criteria

All human, animal and in vitro studies were included. Review articles, letters to editor, unpublished data such as thesis and published studies from countries other than Iran were omitted. Two reviewers independently examined the title and abstract of each article to avoid duplications.

Data extraction and classification

Data including investigated disease(s), common and scientific names of investigated herbs were extracted from the titles and abstracts of articles. Investigated subjects and diseases have been categorized in 18 groups, including cancer, cardiovascular, cellular and molecular (Cell. Mol.) studies, embryology, endocrinology, genitouriology, gastrointestinal (GI), gynecology, immunology, infectious, metabolism, mucocutaneous, musculoskeletal, neuroscience, ophthalmology, renal, reproductive, and respiratory systems (Table 2).

Botanical scientific nomenclature

The appropriate scientific name and endemicity of all herbs introduced in the reviewed articles were validated taxonomically according to Ghahreman and Attar [11], Mozaffarian [12] and www.theplantlist.org [13]. Botanical scientific nomenclatures applied in the reviewed articles were evaluated according to Rivera et al. [14].

Findings

Studied herbs and the aims of the treatments were extracted from the titles and abstracts of 1319 articles written by Iranian scientists and researchers from 1969 up to the end of 2012. Information on the studied herbs including their division, family, scientific names and names used in the reviewed articles, Persian names, and the aims of the studies are shown in appendix 1. Totally, the efficacy of 560 herbs belonging to 100 families was studied. Of them, 511 herbs belonging to 77 families were the most studied families with 412, 211, 179 and 75 studies in each, respectively. Most of the studied herbs belonged to Lamiaceae (Labiatae), Asteraceae (Compositae), Apiaceae (Umbelliferae), Fabaceae (Leguminosae) with 118, 72, 60 and 38 studied herbs in each, respectively. Among 100 studied herbal families, only one species was studied in 45 families, of them 41 were studied less than 10 times. The herbs including Crocus sativus L. (Iridaceae), Camellia sinensis (L.) Kuntze (Theaceae), Urtica dioica L. (Urticaceae) and Peganum harmala L. (Nitrariaceae) were the most frequently studied species within 66, 16, 13 and 11 studies, respectively. Of 560 studied herbs, the species of 31 studied herbs (5.5%) were not specified in the titles and abstracts of 55 articles. Only 69 of 560 studied herbs (12.3%) were endemic (Table 4) and the remaining 491 studied herbs (87.6%) were not endemic to Iran. Five herbs (0.9%) including C. sativus, Allium sativum L. (Amaryllidaceae), Zataria multiflora Boiss. (Lamiaceae) and Nigella sativa L. (Ranunculaceae) and Teucrium polium L. (Lamiaceae) were the most studied herbs with 66, 51, 41, 35 and 27 studies, respectively. The efficacy of C. sativus and A. sativum was studied on cardiovascular, Cell. Mol., immune, infectious, metabolism, mucocutaneous, neuroscience and renal systems. C. sativus was also examined in embryology, genitourinary, gynecology, musculoskeletal and respiratory systems. Cancer, GI and ocular system were additional aims for research on A. sativum. The effects of Z. multiflora, N. sativa and T. polium were also studied on the same items. The herbs were studied one time in 295 (52.7%) herbs, 2 to 9 times in 236 (42.1%) herbs and 10 to 21 times in 24 (4.3%) (Appendix 1).

Appendix 2 shows the herbs studied for the management of the investigated subjects and diseases in each category. The efficacy of most herbs was investigated in infectious system, metabolism, neuroscience, Cell. Mol. and immunology with 289, 218, 122, 115 and 92 studied herbs in each, respectively (Table 2).

Features and Limitations of our Study

Our study is focused on Iranian research on herbal medicine up to the end of 2012. Data were extracted from titles and abstracts without any evaluation according to available scoring systems [15] and were not checked with the information in the full text of the reviewed articles. Information on the studied herbs and diseases was categorized in 18 groups. The average number of studies for each disease was 35.6 and for each herb was 4.5. The studies were the most studied in infectious, metabolism, mucocutaneous, musculoskeletal, neuroscience, ophthalmology, renal, reproductive, and respiratory systems. Cancer, GI and ocular system were additional aims for research on A. sativum. The effects of Z. multiflora, N. sativa and T. polium were also studied on the same items. The herbs were studied one time in 295 (52.7%) herbs, 2 to 9 times in 236 (42.1%) herbs and 10 to 21 times in 24 (4.3%) (Appendix 1).

Table 1 Search terms used in combination with Iran to find Iranian studies investigating herbal medicines in the management of different aspects of health and disease.

| Botanical, medicine | Herb, pharmaceutical | Herbalism | Plant, pharmaceutical |
|---------------------|----------------------|-----------|-----------------------|
| Botany, medicinal herb | Herb, pharmacodynamic | Herbalism, medical | Plant, pharmacodynamic |
| Botany, medicinal plants | Herb, pharmacokinetic | Herbolgy | Plant, pharmacokinetic |
| Flora, medicinal | Herb, pharmacology | Medicinal, vegetation | Plant, pharmaotherapy |
| Folk, medicine | Herb, pharmaotherapy | Phytomedicine | Plant, pharmacy |
| Galenical | Herb, pharmacy | Phytopharmacy | Plant, remedy |
| Herb, drug | Herb, remedy | Phytotrapry | Plant, medicinal |
| Herb, medicinal | Herbage, medicinal | Plant, drug | Plant, pharmacology |
| Herb, narcotic | Herbal, medicine | Plant, narcotic | Traditional medicine |
Table 2: A categorization of issues investigated in 18 subjects and diseases studied by Iranian herbal researchers.

| Category                    | Number of herbs (studies) | Subject                                                                 |
|-----------------------------|---------------------------|-------------------------------------------------------------------------|
| Cancer                      | 46 (35)                   | adhesive property; anticantercancer, antitumor and antiproliferative effects; cancerogenesis; cell adhesion; chemopreventive effects, tumor growth |
| Cardiovascular system       | 49 (69)                   | angio genesis; antiangiogenic, anemot hematicy, antihypertensive and antihypoxic effects; cardiac cell injury; cardiotoxicity; cardioprotective; cardiovascular; fibrinolytic, hypotensive and vasodilator effects; arterial blood and oxygen pressure; atherosclerosis; biochemical blood parameters; blood platelet adhesion, aggregation and secretion; heart failure; coronary vasodilatation; fatty streaks; hematological and hemolytic indices; ischaemic arrhythmias; isolated heart activity; myocardial ischemia-reperfusion; myocardial oxidative damage; normotensive and hypertensive; reactivity of isolated aorta |
| Cell Mol study              | 115 (141)                 | allelopathic and cytotoxic effects; antigenotoxic effects; apoptosis; cell cycle arrest; cell cycle analysis; cell viability; cell death; differentiation; DNA damage; enzyme activity/inhibition; fibrillation of apo-alpha-lactalbumin; gene expression and regulation; lead toxicity; karyorrhexis; microtubule assembly; mutagenicity; necrosis; nuclear acid synthesis; piknosis; radioprotective effects; teratogenicity |
| Embryology                  | 4 (4)                     | antiandrogenic and antihirsutism effects; endocrinotoxicity; levels of hormones |
| Endocrine system            | 6 (7)                     | antietrogenicity; fetal development; microstructure of placenta |
| Genitourinary system        | 11 (17)                   | erectile dysfunction; gonadal and sex hormone levels; impotence; semen quality; sexual behaviors; sexual impairment; spermatogenesis; sperm quality; sperm parameters |
| GI                          | 58 (69)                   | antispasmodic and anti-diarrhoeal effects; aphthous stomatitis; aphthous ulcers; coeliac disease; colitis; delayed gastric emptying; gastric acid and pepsin secretions; gastric irritation; gastric ulcer; gastroprotective effects; heaptotoxic and hepatoprotective effects; ileum antispasmodic effects; ileum contractions; ileal relaxation; iron absorption; liver cirrhosis; liver injury; nausea and vomiting in pregnancy; oral toxicity; pancreatitis; pediatric functional constipation; peptic ulcer; salivation; sclerosing cholangitis; small intestinal damage; spasmogenic activity in small intestine; steatohepatitis; stoma care; stomach and intestinal disorders; stomatitis |
| Gynecology                  | 21 (34)                   | abortifacient effects; amenorrhea; dysmenorrhea; estrus Cycle; menstrual bleeding; milk Production; ovarian cysts; pregnancy; nausea and vomiting in pregnancy; premenopausal, perimenopausal, menopausal and postmenopausal symptoms; premenstrual syndrome; striae gravidarum in pregnancy; uterine bleeding; uterus contraction |
| Immunology                  | 92 (116)                  | acquired immune deficiency syndrome; allergic inflammation; allergic Rhinitis; anti-Behçet armamentarium; antihistaminic effects; anti-inflammatory and anti-pyretic effects; autoimmune encephalomyelitis; bowel inflammation; inflammatory bowel diseases; irritable bowel syndrome; chronic rhinosinusitis; colitis; immunologic colitis; complement activity; cytokine release and pattern; denture stomatitis; dermatitis; diapper dermatitis; immune responses; humoral immunity; antibody production; immunoinhibitory, immunomodulatory and effects; immunotherapy; inflammation; inflammatory biomarkers; inflammatory diseases; innate immunity; lung inflammation; allergic airway inflammation; lupus nephritis; mucositis; multiple sclerosis; oral allergy syndrome; osteoarthritis; pancreatitis; peritoneal macrophages activity; rhinosinusitis; steatohepatitis |
| Infectious system           | 289 (308)                 | antihelminthic effects; antibacterial, antifungal, antimicrobial, antiprotozoal and antiviral effects; anti-Leishmanial effects; leishmaniasis; anti-malarial and antiplasmodial effects, malaria; bioactivity; biological activity; biofilm formation; fermentation parameters; hydatid cyst; hydatid cyst protoscolices; larvicial activity; microbial mortadella sausage; multidrug-resistance; necrotic dermatitis; preventing sepsis |
| Metabolism                  | 218 (295)                 | antiglycating effects; antioxidative effects; free-radical scavenging properties; bioenergetic status independently of age; biological properties; bone mineralisation; bone strength; bone turnover indicators; cartilage thickness; diabetes and related complications; blood glucose; insulin release; insulin resistance; nasal absorption of insulin; dyslipidemia, hypercholesterolemia, hyperglycemia, hyperlipidemia; histological changes of pancreatic beta-cells; hypoglycemic effect; hypouricemic effects; LDL oxidation; metabolic syndrome; obesity; oxidant-related diseases; removal of cadmium ions; resting energy expenditure; safety evaluation; serum levels of bilirubin, cholesterol, creatinine, glucose, iron, lipids, lipoproteins, nitrogen and urea |
| Mucocutaneous system        | 34 (47)                   | acne vulgaris; alopecia areata; anti-keloid armamentarium; antiplaque effects, dental biofilm; dental caries, dental plaque, gingivitis, gingival disease, periodontal diseases; antisolar and moisturizing activities; burn wounds; Skin lesions; wound healing effects; dermal toxicity; dermatology; dermatophytois; eczema; mouthwashes; nipple crack, nipple sore; non-healed ulcers; oral aphthous lesions; oral lichen planus; periodontal disease; peristomal skin lesions; pityriasis versicolor; psoriasis vulgaris |
From an Herb-disease Encyclopedia to an Herb-disease Database

An herb- disease encyclopedia comes to the help of herbal researchers and enthusiasts to find that a desired herb is useful or recommended for which kind(s) of health problems, and/or the management, pretreatment or treatment of a specific disease or disorders has been examine using which herb(s) or herbal product(s). Information on the history of traditional uses of herbs or traditional management of known health problems can be included as well. As mentioned earlier, due to the vast amount of information available for herbs and diseases, it is worth to emphasize that a comprehensive database in which the valid and assessed results of herbal research on various aspects of diseases are updated in detail is an ideal tool to increase the efficiency of research and to shorten the way of the herbal management and control of diseases [7]. The authors are currently working on the schema of an ideal herbal database, which will be published in future.

Recounting Some of the Salient Points of Herbal Research

Knowing the gaps in studies and research, including research on medicinal herbs is of value to find out suitable guideline and policy for defining an efficient research. In our pervious review, the efficacy of medicinal herbs on the management of different aspects of diabetes mellitus (DM), including parameters in DM, pharmacological mechanisms, and the effects on the functions of organs were collected and compared (Table 4) [7] here, we showed that some important aspects of DM other than the blood glucose and HbA1C levels were not considered in both Iranian and non-Iranian herbal research. We think that providing and improving such a standard framework for diseases and health problems help herbal researchers to design their studies according to unexamined items which are also appropriate to

| Musculoskeletal system | 7 (7) |
|------------------------|------|
| Chondrogenesis and osteogenesis; chondroprotective effects; ischemia-reperfusion in skeletal muscle; knee joint; muscle relaxant effects |

| Neuroscience | 122 (217) |
|-------------|----------|
| Acute stress; Alzheimer’s disease; amnesia; analgesic, anesthetizing, anticonvulsant and antinociceptive effects; anorexia; anti-cholinergic and anticholinesterase effects; anticholinergic effects; antidepressant effects; depression; attention-deficit/hyperactivity disorders; autistic disorders; brain injury; spinal cord injury; cerebral ischemia-reperfusion injury; carpal tunnel syndrome; epilepsy, epileptic seizures, seizures; hippocampal neurites; hyperalgesia and motor nerve conduction velocity; learning and memory, recognition; migraine headache; morphine analgesic tolerance, morphine antinociceptive tolerance, morphine dependence, morphine withdrawal syndrome, opiates withdrawal; motor coordination; neurodegenerative disorders; neuronal hyperexcitability; neuroprotective effects; neurotoxicity; obsessive-compulsive disorder; pain; pentobarbital hypnosis; sedative, hypnotic and anxiolytic effects; antianxiety effects; anxiety; preoperative anxiety; hypnotic effect; sleep-prolonging effect |

| Ophthalmology | 4 (4) |
|---------------|------|
| Cataract; cataractogenesis; corneal neovascularization; ocular abnormalities; ocular toxicity; uveitis |

| Renal system | 28 (34) |
|--------------|--------|
| Diabetic nephropathy; diuretic effect; hemodialysis patients; kidney calculi; kidney disease; morphometric indices of kidney; nephroprotective effects; nephrotoxicity; nephrolithiasis; peritoneal dialysis patients; renal ischemia; renal reperfusion injury; renal transplant recipients; renal-transplanted patients; urinary clearance of nicotine; urolithiasis; antiurolithic (antiurolithiatic) effects |

| Reproductive system | 12 (15) |
|---------------------|--------|
| Antifertility effects; fertility; maturation of oocytes; offspring sex ratio; reproduction stimulatory properties; reproductive and neurobehavioral end points; reproductive indices; reproductive system; reproductive tract histology; testicular damages |

| Respiratory system | 16 (32) |
|--------------------|--------|
| Antitussive effect; asthma; antithrombotic effect; bronchodilatory effect; cough associated with ACE inhibitors; histamine (H1) receptors of tracheal chains; hypoxia; lung injury; lung lavage; lung pathology and lung inflammation; pulmonary fibrosis; respiratory symptoms and pulmonary function tests; tracheal chains; tracheal muscle responsiveness |

Table 3 Division, number of families, total studies, number of studied herbs, number of endemic and unknown species per division of studied herbs in Iranian herbal research.

| Division              | Number of families | Total studies/ division | Number of studied herbs/ division | Number of endemic | Unknown species |
|-----------------------|-------------------|-------------------------|----------------------------------|------------------|-----------------|
| Angiosperm- Dicotyledon| 77                | 1469                    | 511                              | 66               | 28              |
| Angiosperm- Monocotyledon | 10            | 194                     | 25                               | 3                | 1               |
| Gymnosperm            | 5                 | 30                      | 13                               | -                | -               |
| Monilophytes          | 3                 | 5                       | 4                                | -                | -               |
| Thallophyta           | 5                 | 7                       | 7                                | -                | -               |
| Total                 | 100               | 1705                    | 560                              | 69               | 30              |
| Division | Family | Scientific name | Persian name |
|----------|--------|----------------|-------------|
| Apiaceae (Umbelliferae) | | Dicyclocopa persica Boiss. | Chatr gorzi |
| | | Diplotaenia damavandica Mozaff., Hedge & Lamond | Kozal |
| | | Echinophora cinerea (Boiss.) Hedge & Lamond | Khosharizeh kuhestani |
| | | Echinophora platyloba DC. | Khosharizeh |
| | | Ferula persica Willd | Koma, Barijeh, Anghouzeh |
| | | Haussknechtia elymaica Boiss. | Johour |
| | | Heracleum rechingeri Manden. | Golpar |
| | | Kelussia odoratissima Mozaff. | Karafs e bakhtiari |
| | | Narthex asafoetida Falc. ex Lindl. (syn. Ferula asafoetida H.Karst.) | Koma, Barijeh, Anghouzeh |
| | | Semenovia tragioides (Boiss.) Pimenov & V.N. Tikhom. | - |
| Asteraceae (Compositae) | | Achillea kellalensis Boiss. & Hausskn. | Boumadaran |
| | | Achillea talagonica Boiss. | Boumadaran |
| | | Cirsium bracteosum DC. | Kangar bargedar |
| | | Tanacetum budjurdense (Rech. f.) Tzvelev | Mina-e bojurdan |
| | | Tanacetum sonbolii Mozaff. | Mina |
| | | Alkanna frigida Boiss. | Shangar |
| | | Onosma bulbotrichum DC. | Zangulei |
| | | Buxus sempervirens subsp. hycrana (Pojark.) Takht. (syn: Buxus hycrana Pojark.) | Shemshad |
| | | Euphorbia hebecarpa Boiss. | Farfioun |
| | | Euphorbia kopetdaghii (Prokh.) Prokh. (syn: Euphorbia aelenii Rech.f.) | Farfioun |
| | | Astragalus gypsocola Maassoumi & Podlech | Gavan |
| | | Astragalus stepporum Podlech | Gavan |
| | | Oreophysa microphylla (Jaub. & Spach) Browicz | Niam hobabi |
| | | Parkinsonia aculeata L. | Darman aghrab |
| | | Ribes khorasanicum Saghafi & Assadi | Angur farangi |
| | | Ajuga chamaecistus subsp. tomentella (Boiss.) Rech.f. | Lobdisi |
| | | Dracopehalum kotschyi Boiss. | Badranjbuyeh |
| | | Dracopehalum polyaethum Bornm. | Badranjbuyeh |
| | | Dracopehalum surmandinum Rech.f. | Badranjbuyeh |
| | | Hymenocrater yazdianus Rech.f. | Gol-e ervaneh |
| | | Lagochilus hispidus (Bél.) Fisch. & C.A.Mey. (syn:Lagochilus kotschyanus Boiss.) | Lob khargushi |
| | | Nepeta crispa Willd. (syn:Nepeta asterotricha Rech.f. ) | Pune sa |
| | | Nepeta menthoides Boiss. & Buhse | Pune sa |
| | | Phlomis anisodonta Boiss. | Goush barreh |
| | | Phlomis olivieri Benth. | Goush barreh |
| | | Phlomis persica Boiss. | Goush barreh |
| | | Rydingia persica (Burm.f.) Scheen & V.A.Albert (syn: Otostegia persica (Burm.f.) Boiss. ) | Golder |
| | | Salvia eremophila Boiss. | Maryam goli |
| | | Salvia hypoleuca Benth. | Maryam goli |
| | | Salvia lachnocalyx Hedge | Maryam goli |
| | | Salvia mirzayanii Rech.f. & Esfand. | Maryam goli |

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Discussion and Conclusion

The most obvious finding is the little attention to endemic herbs to Iran in Iranian research, whereas Iran is a country with a known ancient history in traditional medicine, as well as diverse and rich vegetation. Endemic plants are unique genetic resources which worth further investigation. As we found, most herbs (52.7%) were studied once and the research on them was discontinued. Infectious system was the most investigated area (23.3% of reviewed studies) of Iranian herbal research. Despite the worldwide importance of infectious diseases, we believe that most common health problem of a society should be a priority. As well as, due to the widespread and popular use of herbal medicines, medical staffs should be familiar with traditionally used herbs, including endemic ones. Accordingly, it is expected that herbal researchers prioritize ethnopharmacological research on medicinal herbs, especially endemic ones which are traditionally used in their own country [7]. However, considering the time and expenditure that are spent to such studies, it is crucial to find reasons and motivations of designing such herbal research.

The finding 560 herbs were studied and that most of them possibly have beneficial effects is very promising. None of the five most studied herbs, including C. sativus, A. sativum, Z. multiflora, N. sativa and T. polium were endemic to Iran. C. sativus and A. sativum are among most known medicinal herbs with available phytochemical information [7]. Information collected in Appendix 1 makes it easy to define a research study; however, it is recommended that general considerations for herbal research, as well as specific issues for studies on a specific disease [7] in addition to the history of traditional usages of desired herb(s) are carefully examined from the beginning of an experiment to the end. Botanical scientific nomenclature is another critical case that should never be overlooked [14].

It was interesting for us that most reviewed herbs (95.7%) belonged to angiosperms, possibly due to their vast diversity and geographical distribution. Biogeographers and evolutionary biologists are also surprised with the dramatic rise in the abundance of angiosperms around the world. Various parameters have been hypothesized that play important roles during the early and later stages of angiosperm expansion, as well as the slowdown in the diversification of gymnosperms [16-19]. Perhaps, phytochemical and metabolite comparison between herbs from different plant kingdoms provides more evolutionary clues other than geographical distribution and diversification for more medicinal utilization of angiosperms. It has been reported that chemometric analyses such as reversed-phase high-performance liquid chromatography and biochemical markers can be used for

| Angiosperm-Dicotyledon | Salvia reuteriana Boiss. | Maryam gol |  |
|------------------------|-------------------------|-----------|---|
|                        | Salvia sahedica Boiss. & Buhse | Maryam gol |  |
|                        | Satureja bachtiarica Bunge | Marzeh bakhtiar |  |
|                        | Satureja intermedia C.A. Mey. | Marzeh taleshi |  |
|                        | Satureja khuzistanica Jamzad | Marzeh khuzestani |  |
|                        | Satureja sahedica Bornm. | Marzeh sahandi |  |
|                        | Stachys acerosa Boiss. | Sonboli |  |
|                        | Stachys laxa Boiss. & Buhse | Sonboli |  |
|                        | Stachys obtusiscrena Boiss. | Sonboli |  |
|                        | Stachys subaphylla Rech.f. | Sonboli |  |
|                        | Teucrium persicum Boiss. | Maryam nokhodi shirazi |  |
|                        | Thymus carmanicus Jalas | Avishan kermani |  |
|                        | Thymus daenensis Celak. | Avishan daenai |  |
|                        | Thymus migricus Klokov & Des. Shost. | Avishan azarbaiajani |  |
|                        | Thymus persicus (Roniger ex Rech.f.) Jalas | Avishan irani |  |
|                        | Thymus trautvetteri Klokov & Des.-Shost. | Avishan taleshi |  |
|                        | Zhumeria majdae Rech.f. & Wendelbo | Mohr-e khosh |  |
| Lamiaceae (Labiatae)   | Linum persicum Boiss. | Katan |  |
|                        | Alca hycrana Grossh. | Khatmi |  |
| Malvaceae               | Moringa peregrina (Forssk.) Fiori | Gaz roghani |  |
| Polygonaceae            | Polygonum hyrcanicum Rech.f. | Alafee haftband |  |
| Primulaceae             | Dionysia termeana Wendelbo | Aroo-es sang |  |
|                        | Primula heterochroma Stapf | Pamchal |  |
| Rosaceae                | Geum iranicum Khat. | Alaf-e mobarak |  |
| Rutaceae                | Haplophyllum canalicatum Boiss. | Sodaby |  |
| Amaryllidaceae         | Allium elburzense Wendelbo | Piaz alborzi |  |
|                        | Allium jesdianum Boiss. & Buhse | Piaz Yazdi |  |
|                        | Allium stipitatum Regel (syn: Allium hirtifolium Boiss.) | Mousir |  |
analyzing and classifying intra-specific genetic relationship of plant populations [20,21]. Nowadays, scientists are encouraged to bioinformatics technics and the omics-based approaches in traditional medicine and ethnomedicine studies [22-25] which can be of help to manage the herbal research as large-scale data-rich studies.

Clearly, there is still much to be done to discover the appropriate herbal medicine for the treatment and management of diseases due to the exhausting labor of the investigation on items such as the quality, safety, side effects, toxicity, and pharmacological mechanism for each herb. However, appropriate mechanisms, including standard frameworks for different aspects of diseases and pharmacological mechanisms of medicinal herbs, as well as a specialized database for herbal medicine can be defined to make easier overcoming such obstacles.

Finally, to compensate some features such as industrialization that seems unlikely to be omitted from new human modern life, the human kind restored to use traditional medicine for maintaining his/her health. However, every day more than over, it is needed to admit seriously that the lifestyle is the most effective and appropriate way for maintaining health by the prevention and management of diseases. According to an Iranian proverb, prevention is better than treatment.

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References
1 Kartal M (2007) Intellectual property protection in the natural product drug discovery, traditional herbal medicine and herbal medicinal products. Phytother Res 21: 113-119.
2 Schilter B, Andersson C, Anton R, Constable A, Kleiner J, et al. (2003) Guidance for the safety assessment of botanicals and botanical preparations for use in food and food supplements. Food Chem Toxicol 41: 1625-1649.
3 Pan S, Neeraj A, Srivastava KS, Kishore P, Danquah MK, et al. (2013) A proposal for a quality system for herbal products. J Pharm Sci 102: 4230-4241.
4 Winslow LC, Kroll DJ (1998) Herbs as medicines. Arch Intern Med 158: 2192-2199.
5 McHughes M, Timmernann BN (2005) A review of the use of CAM therapy and the sources of accurate and reliable information. J Manag Care Pharm 11: 695-703.
6 Egan CD (2002) Addressing use of herbal medicine in the primary care setting. J Am Acad Nurse Pract 14: 166-171.
7 Rezaei A, Farzadfard A, Amirahmadi A, Alemi M, Khademi M (2015) Diabetes mellitus and its management with medicinal plants: A perspective based on Iranian research. J Ethnopharmacol 175: 567-516.
8 Patwardhan B, Vaidya ADB (2010) Natural products drug discovery: accelerating the clinical candidate development using reverse pharmacology approaches. Indian J Exp Biol 48: 220-227.
9 Yeung KS, Gubili J, Cassileth B (2008) Evidence-based botanical research: applications and challenges. Hematol Oncol Clin North Am 22: 661-670.
10 WHO (2007) WHO guidelines for assessing quality of herbal medicines with reference to contaminants and residues.
11 Ghahreman A, Attar F (1999) Biodiversity of Plant Species in Iran, (1st edn), Tehran University, Iran.
12 Mozaffarian V (2008) A Dictionary of Iranian Plant Names, (6th edn), Farhang Moaser, Tehran.
13 www.theplantlist.org
14 Rivera D, Allkin R, Obón C, Alcaraz F, Verpoorte R, et al. (2014) What is in a name? The need for accurate scientific nomenclature for plants. J Ethnopharmacol 152: 393-402.
15 Chan K, Shaw D, Simmonds MSJ, Leon CJ, Xu Q, et al. (2012) Good practice in reviewing and publishing studies on herbal medicine, with special emphasis on traditional Chinese medicine and Chinese materia medica. J Ethnopharmacol 140: 469-475.
16 Fiz-Palacios O, Schneider H, Heinrichs J, Savolainen V (2011) Diversification of land plants: insights from a family-level phylogenetic analysis. BMC Evol Biol 11: 341.
17 Leitch AR, Leitch IJ (2012) Ecological and genetic factors linked to contrasting genome dynamics in seed plants. New Phytol 194: 629-646.
18 Endress PK (2011) Angiosperm ovules: diversity, development, evolution. Ann Bot 107: 1465-1489.
19 Augusto L, Davies TJ, Delzon S, De Schrijver A (2014) The enigma of the rise of angiosperms: can we untie the knot? Ecol Lett 17: 1326-1338.
20 Gad HA, El-Ahmady SH, Abou-Shoer MI, Al-Azizi MM (2013) Application of chemometrics in authentication of herbal medicines: a review. Phytochem Anal 24: 1-24.
21 Wang Q, Ruan X, Huang J, Xu N, Yan Q (2006) Intra-specific genetic relationship analyses of Elaeagnus angustifolia based on RP-HPLC biochemical markers. J Zhejiang Univ Sci B 7: 272-278.
22 Sarris J, Ng CH, Schweitzer I (2012) “Omic” genetic technologies for herbal medicines in psychiatry. Phytother Res 26: 522-527.
23 Hao DC, Xiao PG (2015) Genomics and Evolution in Traditional Medicinal Plants: Road to a Healthier Life. Evol Bioinform 11: 197-212.
24 Shen S, Wang Y, Zheng G, He X, Tan Y (2014) Applying bioinformatic technique to discovery molecular mechanism of Banxia and Tianma combination treating tinnitus, IEEE International Conference on Bioinformatic and Biomedicine, pp: 160-161.
25 Lagunin AA, Goel RK, Gawande DY, Pahwa P, Gloriosoza TA, et al. (2014) Chemo- and bioinformatics resources for in silico drug discovery from medicinal plants beyond their traditional use: a critical review. Nat Prod Rep 31: 1585-1611.