



Overview of medicinal plants used for cardiovascular system disorders and diseases in ethnobotany of different areas in Iran

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ABSTRACT

Background and Aims: Today, cardiovascular diseases are the prominent cause of death in industrialized countries which include a variety of diseases such as hypertension, hyperlipidemia, thromboembolism, coronary heart disease, heart failure, etc. Recent research findings have shown that not only the extent of cultivation and production of medicinal plants have not been reduced, but also day-to-day production and consumption have increased. In traditional botanical knowledge, herbal medicines are used for the treatment of cardiovascular disorders. In this study, we sought to gather and report medicinal plants used to treat these diseases in different regions of Iran.

Methods: The articles published about ethnobotanical study of cardiovascular diseases in various regions of Iran, such as Arasbaran, Sistan, Kashan, Kerman, Isfahan Mobarakeh, Lorestan and Ilam were prepared and summarized.

Results: The results of ethnobotanical studies of various regions of Iran, such as Arasbaran, Sistan, Kashan, Kerman, Isfahan Mobarakeh, Lorestan and Ilam were gathered. The results showed that sumac plants, barberry, yarrow, wild cucumber, horsetail, Eastern grape, hawthorn, wild rose, spinach, jujube, buckwheat, chamomile, chicory, thistle, Mary peas, nightshade, verbena, sorrel, cherry, citrullus colocynthis, Peganum harmala, sesame and so many other plants are used for the treatment of cardiovascular diseases and disorders.

Conclusion: Herbal medicines are used effectively for some cardiovascular diseases. Rigorous training of patients to take precautions and drug interactions into account and to avoid the arbitrary use of medicinal plants is very important.

Implication for health policy/practice/research/medical education:

Medicinal plants are used effectively for some cardiovascular diseases. Cautious about drug interactions and side effects of medicinal plants is very important.

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Introduction

Studies show that cardiovascular diseases are currently the leading cause of death in industrialized countries. Documented reports indicate that cardiovascular diseases in the United States led to death of 950 000 people in 1998 and spending of 118 billion dollars (1). Cardiovascular diseases include a broad range of diseases, including hypertension, hyperlipidemia, thromboembolism, coronary

heart disease, heart failure, etc (2-4). Hyperlipidemia is a predisposing factor for many diseases that can cause complications such as atherosclerosis, hypertension, increased risk of stroke and fatty liver (5,6). Hypertension is the most common disorder and is known as a risk factor for the diagnosis of myocardial infarction, stroke, peripheral vascular disease, and a major factor in the development of cardiovascular disease and mortality (7-9). Pathophysi-

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ological disorders such as type 2 diabetes occur due to impaired insulin secretion, insulin resistance, and over-production of glucose by the liver (10). The usage of natural herbs increased because of beneficial effects of herbs and easier return to nature in comparison to chemical drugs (11-22). In some countries, 80% of the drugs supplied to the pharmaceutical market have natural origin, so that now 90% of people in these countries use herbal medicines (23-34). Recent research findings have shown that not only the extent of cultivation and production of medicinal plants have not been reduced, but also day-to-day production and consumption have increased (35-42). In traditional botanical knowledge, herbal medicines are used for the treatment of cardiovascular disorders. In this study, we tried to gather medicinal plants used to treat these diseases in different parts of Iran.

Methods

The articles published about ethnobotanical study of cardiovascular diseases in various regions of Iran, such as Arasbaran, Sistan, Kashan, Kerman, Isfahan Mobarakeh, Lorestan and Ilam were prepared and summarized.

Results

The findings on native medicinal plants used for the treatment of cardiovascular disorders in different areas of Iran

including Arasbaran, Sistan, Kazeroon, Kashan, Kerman, Isfahan (Mobarakeh), Ilam and Lorestan are respectively summarized in Tables 1 to 8.

Conclusion

The herbal medicines can be beneficial for some heart diseases. Rigorous training of patients to take precautions and drug interactions into account and to avoid the arbitrary use of medicinal plants is very important (34).

Along with the increased use of herbal medicines, useful information about the interactions of these supplements and medications should be given to the patients to prevent the complications resulting from their interactions that are sometimes very critical. There are many plants that have therapeutic effects, may prevent cardiovascular diseases, and influence hypolipidemia, blood pressure and heart failure through antioxidant, anti-clotting, hypotensive, anti-atherosclerosis, heart rate-regulating and vasodilating properties (6,7). The plants may also have a negative impact on the performance of the heart and blood vessels, including the development of arrhythmia, blood pressure and similar effects on the sympathetic nervous currents that cause interference in the activity of the heart.

Authors' contributions

All the authors contributed in design and preparation

Table 1. Medicinal plants used in the treatment of cardiovascular diseases in Arasbaran (43)

| Scientific name | Family Name | Persian Name | Organ Used | Treatment Effect |
|--------------------------------|-----------------|--------------------|-------------------------|--|
| <i>Cotinus coggygria</i> | Anacardiaceae | Derakht Par | Leaf | Astringent |
| <i>Rhus coriaria</i> L. | Anacardiaceae | Sumagh | Leaf and Fruit | Blood purification |
| <i>Berberis vulgaris</i> L. | Berberidaceae | Zereshk | Fruit | Reduction of blood pressure |
| <i>Achillea millefolium</i> L. | Compositae | Boomadarn | Flowering branches | Reduction of blood pressure |
| <i>Ecbalium elaterium</i> L. | Cucurbitaceae | Khiare Vahshi | Fruit | Reduction of blood pressure |
| <i>Juniperus communis</i> | Cupressaceae | Pirou | Fruit | Blood purification |
| <i>Equisetum arvense</i> | Equisetaceae | Dom Asb | Aerial | Diabetes |
| <i>Ribes orientale</i> | Grossulariaceae | Ghalesh Anghour | Fruit | Regulation of blood pressure, removal of bile |
| <i>Polypodium vulgare</i> | Polypodiaceae | Besfij | Rhizome | Removal of bile, fat digestion and fat reduction |
| <i>Portulaca oleracea</i> | Portulacaceae | Khorfeh | Aerial | Blood purification |
| <i>Crataegus monogyna</i> | Rosaceae | Zalzalak | Flower and Leaf | Nourishing of the heart, regulation of heart rate and blood pressure |
| <i>Rosa canina</i> | Rosaceae | Nastaran Vahshi | Flower and Leaf | Blood purification |
| <i>Fragaria vesca</i> L. | Rosaceae | Tootfarangi Vahshi | Leaf, rhizome and Fruit | Nourishing of the heart, treatment of anemia |
| <i>Rubus caesius</i> L. | Rosaceae | Tameshk | Fruit and Leaf | Astringent, anti-diabetic, tonic and blood purification |
| <i>Taxus baccata</i> L. | Taxaceae | Sorkhedar | Leaf | Reduction of blood pressure |

Table 2. Medicinal herbs used in the treatment of cardiovascular diseases in Sistan (44)

| Scientific name | Family Name | Persian Name | Organ Used | Treatment Effect |
|--|----------------|--------------|------------|--|
| <i>Capparis spinosa</i> L. | Capparidaceae | Koor | Root | Treatment of anemia |
| <i>Eucalyptus camaldulensis</i> Dehnh. | Myrtaceae | Moort | Leaf | Astringent |
| <i>Nigella sativa</i> L. | Ranunculaceae | Siah Daneh | Fruit | Treatment of blood fat, blood pressure, diabetes |
| <i>Suaeda aegyptiaca</i> | Chenopodiaceae | Esfenaj | Leaf | Treatment of anemia, blood purifier |
| <i>Zizyphus jujube</i> | Rhamnaceae | Annab | Fruit | Blood purifier |

Table 3. Medicinal plants used in the treatment of cardiovascular diseases in Kazeroon (45)

| Scientific name | Family Name | Persian Name | Organ Used | Treatment Effect |
|--------------------------------|---------------|----------------|----------------|----------------------------------|
| <i>Anthemis austro-iranica</i> | Asteraceae | Babooneh | Aerial | Cardiac tonic |
| <i>Cichorium intybus</i> L. | Asteraceae | Kasni | Aerial | Blood purifier and cardiac tonic |
| <i>Silybum marianum</i> | Asteraceae | Kharmaryam | Fruit and leaf | Lowering of blood pressure |
| <i>Capsella bursa-pastoris</i> | Brassicaceae | Kiseh Keshish | Leaf and stem | Astringent |
| <i>Teucrium polium</i> L. | Lamiaceae | Maryam Nokhodi | Leaf | Diabetes, blood fat |
| <i>Melilotus indicus</i> | Papilionaceae | Shabdar | Leaf | Increase in venous blood |
| <i>Prosopis farcta</i> | Papilionaceae | Jagjege | Fruit | Anti-atherosclerosis |
| <i>Portulaca oleracea</i> L. | Portulacaceae | Khorfe | Aerial | Blood purification |
| <i>Rosa canina</i> L. | Rosaceae | Nastaran | Flower | Astringent |
| <i>Solanum nigrum</i> L. | Solanaceae | Tajrizi | Fruit and leaf | Diabetes and blood fat |
| <i>Verbena officinalis</i> L. | Verbenaceae | Shahpasand | Fruit and leaf | Blood fat |

Table 4. Medicinal plants used in the treatment of cardiovascular disease in Kashan (46)

| Scientific name | Family Name | Persian Name | Organ Used | Treatment Effect |
|---------------------------------|-------------|--------------|-----------------|-------------------------------|
| <i>Anthemis gayana</i> Boiss. | - | Babooneh | Leaf and flower | Treatment of blocked arteries |
| <i>Rumex conglomerates</i> Murr | - | Torshak | Leaf and stem | Blood purification |

Table 5. Medicinal plants used in the treatment of cardiovascular disease in Kerman (47)

| Scientific name | Family Name | Persian Name | Organ Used | Treatment Effect |
|------------------------------|----------------|--------------------|------------|--|
| <i>Berberis integerrima</i> | Berberidaceae | Zereshk | Fruit | Blood purification |
| <i>Cerasus vulgaris</i> | Rosaceae | Albaloo | Fruit | Reduction in blood fat |
| <i>Citrullus colocynthis</i> | Cucurbitaceae | Hendevane Aboljahl | Fruit | Diabetes |
| <i>Coriandrum sativum</i> | Apiaceae | Ghashniz | Fruit | Reduction in blood fat Hypoglycemic effect |
| <i>Hordeumvulgare</i> | Poaceae | Joo | Fruit | Hypoglycemic effect |
| <i>Peganumharmala</i> | Zygophyllaceae | Esfand | Seed | Hypoglycemic effect |
| <i>Sesamum indicum</i> | Pedaliaceae | Konjed | Seed | Reduction in blood fat |

Table 6. Medicinal plants used in the treatment of cardiovascular disease in Mobarakeh, Isfahan (48)

| Scientific name | Family Name | Persian Name | Organ Used | Treatment Effect |
|-------------------------------------|---------------|--------------|---------------|-----------------------------|
| <i>Gundelia tournefortii</i> L | Asteracea | Kangar | Leaf | Reduction in blood fat |
| <i>Ziziphus jujuba</i> (L) H.Karst | Rhamnaceae | Annab | Fruit | Blood purification |
| <i>Mentha spicata</i> L | Lamiaceae | Nana | Leaf | Reduction in blood fat |
| <i>Cichorium intybus</i> L | Asteraceae | Kasni | Aerial | Blood purification |
| <i>Rumex crispus</i> L. | Polygonaceae | Torshak | Fruit | Reduction in blood fat |
| <i>Arctium minus</i> Hill. | Asteraceae | Baba Adam | Root | Blood purification |
| <i>Anethum graveolens</i> L. | Apiaceae | Shavid | Leaf | Reduction in blood fat |
| <i>Zingiber officinale</i> Roscoe | Zingiberaceae | Zanjebil | Leaf | Reduction in blood fat |
| <i>Trigonella foenum-graecum</i> L. | Papilionaceae | Shanbalileh | Leaf and Seed | Reduction in blood fat |
| <i>Senna alexandrina</i> Mill | Papilionaceae | Sana | Leaf | Reduction in blood fat |
| <i>Rumex crispus</i> L. | Polygonaceae | Torshak | Leaf | Reduction in blood pressure |
| <i>Ziziphus jujuba</i> (L) H.Karst | Rhamnaceae | Annab | Fruit | Reduction in blood pressure |
| <i>Olea europaea</i> L | Oleaceae | Zeytoon | Fruit | Reduction in blood pressure |

Table 7. Medicinal plants used in the treatment of cardiovascular disease in Ilam (49)

| Scientific name | Family | Persian name | Organ used | Treatment effect |
|---|--------------|----------------|--------------------|----------------------------|
| <i>Anethum graveolens</i> | Umbelliferae | Shevid | All parts of Plant | Reduction in blood fat |
| <i>Cichorium intybus</i> | Asteraceae | Kasni | Root | Reduction in blood fat |
| <i>Lactuca sativa</i> | Compositae | Kahoo | Leaf | Reduction in blood fat |
| <i>Malva neglecta</i> | Malvaceae | Panirak | Leaf and Stem | Blood purification |
| <i>Nectaro scordeum tripedale</i> <i>N. coelzi</i> | Alliaceae | Piaz Lorestani | Aerial | Treatment of hypolipidemia |
| <i>Ocimum bacilicum</i> | Laminaceae | Reyhan | Leaf | Reduction in blood fat |

Table 8. Medicinal plants used in the treatment of cardiovascular disease in Lorestan (50)

| Scientific name | Family | Persian Name | Organ Used | Treatment Effect |
|---|----------------|-------------------|------------------------|-----------------------------------|
| <i>Citrullus colocynthis</i> (L.) Schrad. | Cucurbitaceae | Henzel | Fruit | Diabetes |
| <i>Crataegus pontica</i> C. Koch. | Rosaceae | Zalzalk | Fruit | Blood pressure |
| <i>Glycyrrhiza glabra</i> L. var. <i>glabra</i> | | Shirin Bayan | Root and flower | Diabetes |
| <i>Gundelia tournefortii</i> L. | Asteraceae | Kangar | Leaf and stem | Diabetes |
| <i>Nerium oleander</i> L. | Apocynaceae | Khar Zahre | Leaf and flower | Cardiac tonic |
| <i>Paliurus spina-christi</i> Miller. | Rhamnaceae | Darg dar | Fruit | Blood pressure |
| <i>Prosopis farcta</i> | Mimosaceae | Kohorak | Fruit | Diabetes |
| <i>Quercus brantii</i> | Fagaceae | Baloot | Fruit | Diabetes |
| <i>Rheum ribes</i> L. | Polygonaceae | Rivas | Stem | Blood pressure |
| <i>Ulmus glabra</i> Hudson. | | Vazm | Leaf | Cardiac disorders and arrhythmias |
| <i>Olea europea</i> | Oleaceae | Zeitoun | Leaf and seed | Blood fat control |
| <i>Urtica dioica</i> | Urticaceae | Ghazane | Leaf and branches | Reduction in blood fat |
| <i>Vitis vinifera</i> | Vitaceae | Angour | Fruit | Reduction in blood fat |
| <i>Morus alba</i> | Moraceae | Toot | Fruit | Reduction in glycemia |
| <i>Berberis integrima</i> | Berberidaceae | Zereshk | Leaf and stem | Treatment of diabetes |
| <i>Pistacia atlantica</i> | Anacardiaceae | Boneh | Juice | Treatment of glycemia |
| <i>Capparis spinosa</i> | Capparaceae | Hendevne Aboljahl | Fruit and leaf | Reduction in glycemia |
| <i>Urtica dioica</i> | Urticaceae | Ghazane | Branches | Reduction in glycemia |
| <i>Valeriana officinalis</i> L | Valerianaceae | Sonboleiteb | Fruit | Reduction in glycemia |
| <i>Melilotus officinalis</i> | Leguminosae | Yonje | Flower, Leaf and Stem | Reduction Blood Glucose |
| <i>Nectaroscordeum tripedale</i> <i>Nectaroscordeum coelzi</i> | Amaryllidaceae | Piaze Lorestani | Branches | Reduction in blood pressure |
| <i>Falcaria vulgaris</i> | Apiaceae | Gazayaghi | Leaf, flower and Stem | Reduction in blood pressure |
| <i>Smyrniium cordifolium</i> | Umbelliferae | Andool | Seed | Reduction in blood pressure |
| <i>Crocus hasskenechtii</i> | Iridaceae | Zaferan | Root | Reduction in blood pressure |
| <i>Berberis integrima</i> | Berberidaceae | Zereshk | Leaf and Stem | Reduction in blood pressure |
| <i>Ziziphus spina-christi</i> <i>Ziziphus nummularia</i> | Rhamnaceae | Sedr | Flower, leaf and Fruit | Reduction in blood pressure |
| <i>Allium ursinum</i> | Liliaceae | Sir | Bulb | Reduction in blood pressure |
| <i>Tragapogon caricifolius</i> | Compositae | Shang | All parts of plant | Reduction in blood pressure |
| <i>Anethum graveolens</i> | Umbelliferae | Shevid | All parts of plant | Reduction in blood pressure |
| <i>Amygdalus scoparia</i> | Rosaceae | Badam | Fruit | Reduction in blood pressure |

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Conflict of interests

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Ethical considerations

Ethical issues (including plagiarism, misconduct, data fabrication, falsification, double publication or submission, redundancy) have been completely observed by the authors.

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References

1. Eisenberg DM, David RB, Ettner SL. Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national survey. *JAMA* 1998;280:1569-1575.
2. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. *World Health Organ Tech Rep Ser.* 2000;894:1-253.

3. Khosravi-Boroujeni H, Sarrafzadegan N, Mohammadifard N, Sajjadi F, Maghroun M, Asgari S, et al. White rice consumption and CVD risk factors among Iranian population. *J Health Popul Nutr.* 2013;31(2):252-261.
4. Sadeghi M, Khosravi-Boroujeni H, Sarrafzadegan N, Asgary S, Roohafza H, Gharipour M, et al. Cheese consumption in relation to cardiovascular risk factors among Iranian adults- IHHP Study. *Nutr Res Pract.* 2014;8(3):336-41.
5. Tajfard M, Ghayour Mobarhan M, Rahimi HR, Mouhebati M, Esmaeily H, et al. Anxiety, depression, coronary artery disease and diabetes mellitus; an association study in ghaem hospital, Iran. *Iran Red Crescent Med J.* 2014;16(9):e14589.
6. Asgary S, Rafieian-Kopaei M, Shamsi F, Najafi S, Sahebkar A. Biochemical and histopathological study of the anti-hyperglycemic and anti-hyperlipidemic effects of cornelian cherry (*Cornus mas L.*) in alloxan-induced diabetic rats. *J Complement Integr Med.* 2014;11(2):63-9.
7. Baradaran A, Nasri H, Rafieian-Kopaei M. Oxidative stress and hypertension: Possibility of hypertension therapy with antioxidants. *J Res Med Sci.* 2014;19(4):358-67.
8. Vasan RS, Beiser A, Seshadri S, Larson MG, Kannel WB, et al. Residual lifetime risk for developing hypertension in middle-aged women and men: the Framingham Heart Study. *JAMA* 2002;287:1003-1010.
9. Asgary S, Sahebkar A, Afshani M, Keshvari M, Haghjooyjavanmard Sh, Rafieian-Kopaei M. Clinical evaluation of blood pressure lowering, endothelial function improving, hypolipidemic and anti-inflammatory effects of pomegranate juice in hypertensive subjects. *Phytother Res.* 2014;28(2):193-199.
10. Rafieian-Kopaei M, Behradmanesh S, Kheiri S, Nasri H. Association of serum uric acid with level of blood pressure in type 2 diabetic patients. *Iran J Kidney Dis.* 2014;8(2):152-154.
11. Bahmani M, Shirzad HA, Majlesi M, Shahinfard N, Rafieian-Kopaei M. A review study on analgesic applications of Iranian medicinal plants. *Asian Pac J Trop Med.* 2014;7(Suppl 1):43-53.
12. Bahmani M, Farkhondeh T, Sadighara P. The anti-parasitic effects of *Nicotina tabacum* on leeches. *Comp Clin Pathol.* 2012;21(3):357-359.
13. Bahmani M, Karamati SA, Banihabib EK, Saki K. Comparison of effect of nicotine and levamisole and ivermectin on mortality of leech. *Asian Pac J Trop Dis.* 2014;4(Suppl 1):477-480.
14. Delfan B, Bahmani M, Rafieian-Kopaei M, Delfan M, Saki K. A review study on ethnobotanical study of medicinal plants used in relief of toothache in Lorestan Province, Iran. *Asian Pac J Trop Dis.* 2014;4(Suppl 2):879-884.
15. Bahmani M, Banihabib EK. Comparative assessment of the anti-annelida (*Limnatis nilotica*) activity of Nicotine with Niclosamide. *Global Veterinaria.* 2013;10(2):153-157.
16. Amirmohammadi M, Khajoenia SH, Bahmani M, Rafieian-Kopaei M, Eftekhari Z, Qorbani M. In vivo evaluation of antiparasitic effects of *Artemisia abrotanum* and *Salvia officinalis* extracts on *Syphacia obvelata*, *Aspiculoris tetrapetra* and *Hymenolepis nana* parasites. *Asian Pac J Trop Dis.* 2014;4(Suppl 1):250-254.
17. Bahmani M, Eftekhari Z. An ethnoveterinary study of medicinal plants in treatment of diseases and syndromes of herd dog in southern regions of Ilam province, Iran. *Comp Clin Path.* 2012;22:403-407.
18. Eftekhari Z, Bahmani M, Mohsenzadegan A, Gholami-Ahangaran M, Abbasi J, Alighazi N. Evaluating the anti-leech (*Limnatis nilotica*) activity of methanolic extract of *Allium sativum L.* compared with levamisole and metronidazole. *Comp Clin Path.* 2012;21:1219-1222.
19. Bahmani M, Abbasi J, Mohsenzadegan A, Sadeghian S, Gholami-Ahangaran M. *Allium sativum L.*: the anti-immature leech (*Limnatis nilotica*) activity compared to Niclosamide. *Comp Clin Path.* 2013;22:165-168.
20. Sarrafchi A, Bahmani M, Shirzad H, Rafieian-Kopaei M. Oxidative stress and Parkinson's disease: New hopes in treatment with herbal antioxidants. *Curr Pharm Des.* 2015 Nov 12.
21. Gholami-Ahangaran M, Bahmani M, Zia-Jahromi N. Comparative and evaluation of anti-leech (*Limnatis Nilotica*) effect of Olive (*Olea Europaea L.*) with levamisole and tiabendazole. *Asian Pac J Trop Dis.* 2012;2(1):S101-S103.
22. Bahmani M, Golshahi H, Mohsenzadegan A, Gholami-Ahangaran M, Ghasemi E. Comparative assessment of the anti-*Limnatis nilotica* activities of *Zingiber officinale* methanolic extract with levamisole. *Comp Clin Pathol.* 2013;22(4):667-670.
23. Forouzan S, Bahmani M, Parsaei P, Mohsenzadegan A, Gholami-Ahangaran M. Anti-parasitic activities of *Zingiber officinale* methanolic extract on *Limnatis nilotica*. *Glob Vet.* 2012;9(2):144-148.
24. Gholami-Ahangaran M, Bahmani M, Zia-Jahromi N. In vitro antileech effects of *Vitis vinifera L.*, niclosamide and ivermectin on mature and immature forms of leech *Limnatis nilotica*. *Glob Vet.* 2012;8:229-232.
25. Bahmani M, Zargaran A, Rafieian-Kopaei M. Identification of medicinal plants of Urmia for treatment of gastrointestinal disorders. *Rev Bras Farmacogn.* 2014;24(4):468-448.
26. Bahmani M, Banihabib EK, Rafieian-Kopaei M, Gholami-Ahangaran M. Comparison of disinfection activities of nicotine with copper sulphate in water containing *Limnatis nilotica*. *Kafkas Univ Vet Fak*

- Derg. 2015;21(1):9-11.
27. Delfan B, Bahmani M, Eftekhari Z, Jelodari M, Saki K, Mohammadi T. Effective herbs on the wound and skin disorders: a ethnobotanical study in Lorestan province, west of Iran. *Asian Pac J Trop Dis.* 2014; 4(Suppl 2):938-942.
 28. Bahmani M, Saki K, Rafieian-Kopaei M, Karamati SA, Eftekhari Z, Jelodari M. The most common herbal medicines affecting *Sarcomastigophora* branches: a review study. *Asian Pac J Trop Med.* 2014;7(Suppl 1): 14-21.
 29. Asadi-Samani M, Bahmani M, Rafieian-Kopaei M. The chemical composition, botanical characteristic and biological activities of *Borago officinalis*: a review. *Asian Pac J Trop Med.* 2014;7(Suppl 1):22-28.
 30. Bahmani M, Zargaran A, Rafieian-Kopaei M, Saki M. Ethnobotanical study of medicinal plants used in the management of diabetes mellitus in the Urmia, Northwest Iran. *Asian Pac J Trop Med.* 2014;7(Suppl 1):348-354.
 31. Delfan B, Bahmani M, Hassanzadazar H, Saki K, Rafieian-Kopaei M. Identification of medicinal plants affecting on headaches and migraines in Lorestan Province, West of Iran. *Asian Pac J Trop Med.* 2014; 7(Suppl 1): 376-379.
 32. Bahmani M, Rafieian-Kopaei M, Hassanzadazar H, Saki K, Karamati SA, Delfan B. A review on most important herbal and synthetic antihelmintic drugs. *Asian Pac J Trop Med.* 2014;7(Suppl 1):29-33.
 33. Saki K, Bahmani M, Rafieian-Kopaei M. The effect of most important medicinal plants on two important psychiatric disorders (anxiety and depression)-a review. *Asian Pac J Trop Med.* 2014;7(Suppl 1):34-42.
 34. Sewell RD, Rafieian-Kopaei M. The history and ups and downs of herbal medicine usage. *J HerbMed Pharmacol.* 2014;3(1):1-3.
 35. Asadbeigi M, Mohammadi T, Rafieian-Kopaei M, Saki K, Bahmani M, Delfan B. Traditional effects of medicinal plants in the treatment of respiratory diseases and disorders: an ethnobotanical study in the Urmia. *Asian Pac J Trop Med.* 2014;7(Suppl 1): S364-S368.
 36. Karamati SA, Hassanzadazar H, Bahmani M, Rafieian-Kopaei M. Herbal and chemical drugs effective on malaria. *Asian Pac J Trop Dis.* 2014; 4(Suppl 2):599-601.
 37. Bahmani M, Rafieian-Kopaei M, Jeloudari M, Eftekhari Z, Delfan B, Zargaran A, et al. A review of the health effects and uses of drugs of plant licorice (*Glycyrrhiza glabra* L.) in Iran. *Asian Pac J Trop Dis.* 2014; 4(Suppl 2):847-849.
 38. Saki K, Bahmani M, Rafieian-Kopaei M, Hassanzadazar H, Dehghan K, Bahmani F, et al. The most common native medicinal plants used for psychiatric and neurological disorders in Urmia city, northwest of Iran. *Asian Pac J Trop Dis.* 2014;4(Suppl 2):895-901.
 39. Bahmani M, Karamati SA, Hassanzadazar H, Forouzan SH, Rafieian-Kopaei M, Kazemi-Ghoshchi B, et al. Ethnobotanic study of medicinal plants in Urmia city: identification and traditional using of antiparasites plants. *Asian Pac J Trop Dis.* 2014;4(Suppl 2):906-910.
 40. Shaygannia E, Bahmani M, Zamanzad B, Rafieian-Kopaei M. A Review Study on *Punica granatum* L. *J Evid Based Complementary Altern Med.* 2015 Jul 30. pii: 2156587215598039.
 41. Bahmani M, Rafieian M, Baradaran A, Rafieian S, Rafieian-kopaei M. Nephrotoxicity and hepatotoxicity evaluation of *Crocus sativus* stigmas in neonates of nursing mice. *J Nephropathol.* 2014;3(2):81-85.
 42. Bahmani M, Eftekhari Z, Saki K, Fazeli-Moghadam E, Jelodari M, Rafieian-Kopaei M. Obesity phytotherapy: review of native herbs used in traditional medicine for obesity. *J Evid Based Complementary Altern Med.* 2015 Aug 12. pii: 2156587215599105.
 43. Zolfaghari A, Adeli A, Mozafarian V, Babaei S, Habibi-Bibalan G. Identification of medicinal plants and indigenous knowledge of local people Arasbaran. *J Med Arum Plants.* 2013;28(3):534-550.
 44. Ranmanesh M, Najafi SH, Yousefi M. Ethnobotanical study of Medicinal Plants of Sistan region. *J Herbal Drugs.* 2010;2:61-68.
 45. Dolatkahhi M, Ghorbani-Nahoji M, Mehrafarin E, Amininezhad GR, Dolatkahhi E. Ethnobotanical study of medicinal plants of Kazeroun: identification, transmittal and traditional uses. *J Med Plants.* 2013;11(2), 45: 163-178.
 46. Abbasi SH, Afsharzadeh S, Mohajeri A. Ethnobotanical study of medicinal plants in Natanz region (Kashan), Iran. *J Herbal Drugs.* 2012; 3(3):157-166.
 47. Sharififar F, Kouhpayeh A, Motaghi MM, Amir-Khosravi A, Pou-Mohseninasab A. The reviews ethnobotany of medicinal plants city of Sirjan, Kerman Province. *J Herbal Drugs.* 2010;3:19-28.
 48. Mardaninejad SH, Vazirpour M. Ethnobotany of Medicinal Plants by Mobarake people (Isfahan). *J Herbal Drugs.* 2013;3(2):111-129.
 49. Ghasemi Pirbalouti A, Momeni M, Bahmani M. Ethnobotanical study of medicinal plants used by kurd tribe in dehloran and abdanan districts, ilam province, Iran. *Afr J Tradit Complement Altern Med.* 2013;10(2):368-385.
 50. Delfan B, Saki K, Bahmani M, Rangsaz N, Delfan M, Mohseni N, et al. A study on anti-diabetic and anti-hypertension herbs used in Lorestan province, Iran. *J Herbmed Pharmacol.* 2014;3(2):71-76.