ISSN: 0974-2115
www.jchps.com Journal of Chemical and Pharmaceutical Sciences

A review of the most important native medicinal plants of Iran effective on gastric acid

Mahmoud Bahmani[1], Abolfazl Abaszadeh[2], Mahmoud Rafieian-kopaei[3]*, Nasrollah Naghdi[4], Omid Afsordeh[4], Farzad Kazemzadeh[4]

[1]Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran
[2]Department of Surgery, School of Medicine, Lorestan University of Medical Sciences, Khorramabad, Iran
[3]Medical Plants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran
[4]Clinical Microbiology Research Center, Ilam University of Medical Sciences, Ilam, Iran
***Corresponding author: E-Mail: rafieian@yahoo.com**

ABSTRACT

Gastrointestinal diseases such as gastric acid hypersecretion are highly prevalent. Gastrointestinal diseases manifest frequently with gastric and duodendal ulcers, gastritis, and dyspepsia which are due to impaired gastric acid secretion. Given the frequency of developing gastrointestinal diseases such as gastric acid hypersecretion and consequently gastric ulcer, the aim of this review article is to report the native medicinal plants of Iran that are used to decrease or neutralize gastric acid. *Ziziphora clinopodioidesl*, *Achillea wilhelmsii*, *Allium sativum*, *Amirkabiria odoratissim*, *Heracleum persicum* L. and *Medicago sativa* are the most native medicinal plants of Iran used to treat gastric acid hypersecretion. Certain compounds such as pulegon, cisisopulegon, cineol, thymol, alpha and beta-pinene, piperitenone, terpenoids, flavonoids, allicin, tannin, terpenoids, saponin, sterol, and leucoanthocyanin, 3, 4, and 7-trihydroxy flavonol, caffeic acid, and fetalid existing in these plants may be the main agents for reducing gastric acid.

KEY WORDS: Gastric acid, medicinal plants, Iran.

1. INTRODUCTION

One group of diseases that are increasing in prevalence are gastrointestinal diseases, most of which manifest with gastric and duodendal ulcers, gastritis, and dyspepsia. Peptic ulcers refer to ulcers of gastric diseases are diseases affecting the stomach and inflammation of the stomach by infection is called gastritis. Another common condition is gastric ulceration, peptic ulcers (Kasper Dennis, 2005). These diseases have various pathogenesis, an infection caused by a bacterium called Helicobacter pylori which acts by various mechanisms is very important (Shirzad, 2015; Salimzadeh, 2015; Razavi, 2015; Bagheri, 2013; 2014; 2015; 2016; Azadegan-Dehkordi, 2015; Zandi, 2013, 2014; Rahimian, 2014). However, to varying degrees, gastric acid hyper-secretion is the main cause of peptic ulcers (Kasper Dennis, 2005).

Although medicinal plants have long been used to treat various diseases, most of their chemical compounds and pharmacological effects have not yet been identified, although numerous trials have recently been done on them (Bagheri, 2013; Bahmani, 2014; 2015; Saki, 2014; Asadbeigi, 2014; Karamati, 2014; Delfan, 2014; 2015). Phenolic and nitrogenic compounds, vitamins, terpenoids such as carotenoids, triterpenes, and alkaloids are some of the effective bioactive compounds of the medicinal plants. Some of these compounds can exert strong antioxidant effects. Antioxidants play an important and fundamental role in the lives of human beings and in modification of various diseases (Bahmani, 2012; 2013; 2014; 2015; Ghasemi Pirbalouti, 2013; Delfan, 2014).

Given highly frequent incidence of gastrointestinal diseases such as gastric acid hypersecretion and consequently gastric ulcer, the aim of this review article is to report the native medicinal plants of Iran that are used to reduce or neutralize gastric acid.

2. MATERIALS AND METHODS

The search terms-gastric acid, extract, essential oil, medicinal plants, and Iran-were used to search for the relevant articles indexed in some databases including Information Sciences Institute, Web of Science, PubMed, Scopus, Google Scholar, and Scientific Information Databases.

3. RESULTS

The review of the findings demonstrated that *Ziziphora Clinopodioides*, *Achillea wilhelmsii*, *Allium Sativum*, *Amirkabiria odoratissim* and *Heracleum persicum* L. were some of the most important native medicinal plants of Iran that are used to reduce gastric acid (Table 1).

Table.1.Native medicinal plants of Iran effective in reducing gastric acid

Scientific name	Family	Persian name	Descriptions
Ziziphora Clinopodioides	Lamiaceae	Avisha- Barik	An interventional, experimental study on mice demonstrated that *Z. clinopodioides* extract in base condition compared inhibited the secretion of gastric acid significantly. Vagotomy caused removal of the inhibitory effect due to *Z. clinopodioides* on gastric secretion. Two mg/kg body weight (BW) of this extract exerted an inhibitory effect on gastric secretion. The hyposecretory effect of one mg/kg BW of the extract on gastric acid was significant compared to control group in vagus nerve stimulation
Achillea wilhelmsii	Asteraceae	Boomadaran	*A. wilhelmsii* extractin base condition significantly inhibited gastric secretion in a dose-dependent manner. Vagotomy caused removal of the extract inhibitory effect on gastric acid. Two mg/kg of *A. wilhelmsii* extract exerted an inhibitory effect on gastric secretion. The hyposecretory effect of the extract on gastric acid secretion was not significant compared to the control group in vagus nerve stimulation
Allium Sativum	Amaryllidaceae	Sir	100 mg/kg of methanolic *A. sativum* extract caused a significant increase in the secretion of gastric acid and pepsin in the mice compared to control group. Electrical stimulation of vagus nerve in the control *A. sativum* group caused a significant increase in the secretion of gastric acid and pepsin
Amirkabiria odoratissim	Umbellifera	Karafs-Kohi	16.2 and 100 mg/kg of metabolic *A. odoratissim* extract caused a significant decrease in the secretion of gastric acid in the first and second base in the mice of both groups treated with *A. odoratissim* compared to control group
Heracleum persicum L.	Apiaceae	Kalpoureh (Maryam-Nokhodi)	Comparison of mean of the first and second samples of each 5, 10, and 20 mg/mL concentrations in treatment group alone was derived significant in vagotomized conditions. Comparison of each one of these conditions demonstrated that in the treatment group, there was a significant difference in gastric acid secretion between base condition and vagotomy and also between vagotomy and vagus nerve stimulation
Medicago sativa	Fabaceae	Yonjeh	250 mg/kg of hydroalcoholic *M. sativa* caused decrease in the secretion of gastric acid with therapeutic effects

DISCUSSION

According to the findings *Ziziphora Clinopodioides*, *Achillea wilhelmsii*, *Allium Sativum*, *Amirkabiria odoratissim* and *Heracleum persicum* L, are some of the most important native medicinal plants of Iran that are used to reduce gastric acid.

In traditional medicine, *Z, clinopodioides* is used to treat gastrointestinal diseases, stomachache, and common cold and as carminative, stomach tonic, anti-inflammatory, sedative, and antipyretic (Zargari, 1997; Naghibi, 2005). *Z. clinopodioides* contains certain compounds such as pulegon, cisisopulegon, cineol, thymol, alpha and beta-pinene, piperitenone, terpenoids, and flavonoids (Sonboli, 2006; Salehi, 2005; Hansel, 1998; Oganesvan, 1991).

Allicin is the main compound of *A. sativum* (Cho, 2006). This plant and most of other plants from this family are effective against a wide variety of diseases (Rafieian-kopaei, 2013; Moghim, 2014; Bahmani, 2013). *H. persicum* was found to contain tannin, terpenoid, saponin, sterol, flavonoid, and leucoanthocyanin (Hansel, 1998). *A. odoratissim* contains 3, 4, and 7-trihydroxy flavonol, caffeic acid, and fetalid (Dapkhahi, 2008). These compounds appear to be the main factors in reducing gastric acid.

Oxidative stress is involved in the pathogenesis of gastric inflammation carcinogenesis and ulcerogenesis, especially in H. pylori infections. Free radicals which induce oxidative stress have been considered as the main cause of stomach stress ulcers. Psychological and physical stress, surgical intervention and Helicobacter pylori (H. pylori) infection all lead to oxidative stress in the stomach. Oxidative stress stimulates production of additional reactive oxygen species and causes decline in antioxidant defense system (Pan, 2008). Hence, antioxidants have been proposed to be effective in prevention and treatment of gastric complications such as gastric ulcers. The plants presented here all have antioxidant activity, therefore, they might be effective in gastric ulcer by their antioxidant properties, other than reducing stomach acid. There are numerous other plants which have antioxidant activity (Nasri, 2014; Rafieian-Kopaei, 2013, 2014; Nasri, 2013, 2014; Baradaran, 2013, 2014; Ghaed, 2012; Asadi SY, 2013; Parsaei, 2013; Amirmohammadi, 2014; Bahmani, 2014; Taghikhani, 2014; Taghikhani, 2012; Heidarian, 2013; Sharafati, 2011).which may have positive effects in gastric complications which worth examining in this regard. Oxidative stress is also involved in the pathogenesis various other diseases including cancer, diabetes, atherosclerosis, Alzheimer and Parkinson diseases (Shirzad, 2009, 2011; Azadmehr, 2011; Mardani, 2014; Nasri, 2013, 2014, 2015; Setorki, 2013; Akhlaghi, 2011; Baradaran, 2012; Moradi, 2013; Rabiei, 2013, 2014; Rahimian, 2013; Rahnama, 2015; Bahmani, 2014, 2015, 2016; Sarrafchi, 2016; Shayganni, 2015; Rafieian-Kopaei, 2011, 2014; Mirhosseini, 2014; Forouzan, 2012; Asadi-Samani, 2014; Shirani, 2011; Hosseini, 2014) Therefore, the plants with antioxidant activity might also be effective in these diseases.

4. CONCLUSION

Therefore, the plants with antioxidant activity might also be effective in these diseases.

REFERENCES

Akhlaghi M, Shabanian Gh, Rafieian-Koupaei M, Parvin N, Saadat M, Akhlaghi M, Citrus aurantium Blossom and Preoperative Anxiety, Revista Brasileira de Anestesiologia, 61(6), 2011,702-712.

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, 4(1), 2014, 250-254.

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, 7(1), 2014, S364-S368.

Asadi SY, Parsaei P, Karimi M, Ezzati S, Zamiri A, Mohammadizadeh F, Rafieian-Kopaei M, Effect of green tea (Camellia sinensis) extract on healing process of surgical wounds in rat, Int J Surg, 11(4), 2013, 332-337.

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, 7(1), 2014, 22-28.

Azadegan-Dehkordi F, Bagheri N, Shirzad H, Rafieian-Kopaei M, The role of Th1 and Th17 cells in glomerulonephritis, J Nephropathol, 4, 2015, 32-37.

Azadegan-Dehkordi F, Bagheri N, Shirzad M, Sanei MH, Hashemzadeh-Chaleshtori M, Rafieian-Kopaei M, Correlation Between Mucosal IL-6 mRNA Expression Level and Virulence Factors of Helicobacter pylori in Iranian Adult Patients With Chronic Gastritis, Jundishapur J Microbiol, 8, 2015, e21701.

Azadmehr A, Hajiaghaee R, Afshari A, Amirghofran Z, Refieian-Kopaei M, yousofi H, Darani and Hedayatollah Shirzad, Evaluation of in vivo immune response activity and *in vitro* anti-cancer effect by Scrophularia megalantha, J Med Plants Res, 5(11), 2011, 2365–2368.

Bagheri N, Azadegan-Dehkordi F, Rahimian G, Hashemzadeh-Chaleshtori M, Rafieian-Kopaei M, Kheiri S, Altered Th17 Cytokine Expression in Helicobacter pylori Patients with TLR4 (D299G) Polymorphism, Immunol Invest, 2016, 1-11.

Bagheri N, Azadegan-Dehkordi F, Sanei H, Taghikhani A, Rahimian G, Salimzadeh L, Associations of a TLR4 single-nucleotide polymorphism with H, pylori associated gastric diseases in Iranian patients, Clin Res Hepatol Gastroenterol, 38, 2014, 366-371.

Bagheri N, Azadegan-Dehkordi F, Shirzad H, Rafieian-Kopaei M, Rahimian G, Razavi A, The biological functions of IL-17 in different clinical expressions of Helicobacter pylori-infection, Microbial pathogenesis, 81, 2015, 33-38.

Bagheri N, Azadegan-Dehkordi F, Shirzad M, Zamanzad B, Rahimian G, Taghikhani A, Mucosal interleukin-21 mRNA expression level is high in patients with Helicobacter pylori and is associated with the severity of gastritis, Centr Eur Immunol, 40, 2015, 61-67.

Bagheri N, Rahimian G, Salimzadeh L, Azadegan F, Rafieian-Kopaei M, Taghikhani A, Association of the virulence factors of Helicobacter pylori and gastric mucosal interleukin-17/23 mRNA expression in dyspeptic patients, EXCLI J, 12, 2013, 5-14.

Bagheri N, Taghikhani A, Rahimian G, Salimzadeh L, Azadegan Dehkordi F, Zandi F, Association between virulence factors of helicobacter pylori and gastric mucosal interleukin-18 mRNA expression in dyspeptic patients, Microbial pathogenesis, 65, 2013, 7-13.

Bahmani M and Banihabib EKh, Comparative Assessment of the Anti- Annelida (*Limnatis nilotica*) Activity of Nicotine with Niclosamide, Global Veterinaria, 10 (2), 2013**,** 153-157.

Bahmani M, Banihabib EKH M, Rafieian-Kopaei M and Gholami-Ahangaran M, Comparison of Disinfection Activities of Nicotine with Copper Sulphate in water Containing Limnatisnilotica, Kafkas Univ Vet Fak Derg, 21 (1), 2015, 9-11.

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, 22, 2012, 403-407.

Bahmani M, Eftekhari Z, Jelodari Z, Saki K, Abdollahi R, Majlesi M, Rafieian-Kopaei M and Rasouli SH, Effect of Iranian herbal medicines in Dysmenorrhea phytotherapy, Journal of Chemical and Pharmaceutical Research, 7(2), 2015, 519-526.

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.

Bahmani M, Farkhondeh T and Sadighara P, The anti-parasitic effects of *Nicotinatabacum* on leeches, Comp Clin Pathol, 21(3), 2012, 357-359.

Bahmani M, Forouzan SH, Fazeli-Moghadam E, Rafieian-Kopaei M, Adineh A and Saberianpour SH, Oak (*Quercus branti*), An overview, Journal of Chemical and Pharmaceutical Research, 7(1), 2015, 634-639,

Bahmani M, Karamati SA, Banihabib EKh, Saki K, Comparison of effect of nicotine and levamisole and ivermectin on mortality of leech, Asian Pac J Trop Dis, 4(1), 2014, 477-480.

Bahmani M, Karamati SA, Hassanzadazar H, Forouzan SH, Rafieian-Kopaei M, Kazemi-Ghoshchi B, Asadzadeh J, Kheiri AGh, Ehsan Bahmani E, Ethnobotanic study of medicinal plants in Urmia city, identification and traditional using of antiparasites plants, Asian Pac J Trop Dis, 4(2), 2014, 906-910,

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*, 3(2), 2014, 81-85.

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, 7(1), 2014, 29-33.

Bahmani M, Rafieian-Kopaei M, Jeloudari M, Eftekhari Z, Delfan B, Zargaran A, Forouzan SH, A review of the health effects and uses of drugs of plant licorice (Glycyrrhiza glabra L) in Iran, Asian Pac J Trop Dis, 4(2), 2014, 847-849.

Bahmani M, Rafieian-Kopaei M, Saki K, Majlesi M, Bahmani F, Bahmani F, Sharifi A, Rasouli SH, Sepahvand R, Abdollahi R, Moghimi-Monfared O and Baharvand S, Identification of medical plants acting on reproductive system disorders, An ethnobotanical study in Urmia, Northwest of Iran, Journal of Chemical and Pharmaceutical Research, 7(2), 2015, 493-502.

Bahmani M, Saki K, Asadbeygi M, Adineh A, Saberianpour SH, Rafieian-Kopaei M, Bahmani F and Bahmani E, The effects of nutritional and medicinal mastic herb (*Pistaciaatlantica*), Journal of Chemical and Pharmaceutical Research, 7(1), 2015, 646-653.

Bahmani M, Saki K, Golshahi H, Rafieian-Kopaei M, Abdali N, Adineh A, Namdari F and Bahmani F, Ethnobotanical and therapeutic uses of camomille, Journal of Chemical and Pharmaceutical Research, 7(1), 2015, 640-645.

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, 7(1), 2014, 14-21.

Bahmani M, Sarrafchi A, Shirzad H, Rafieian-Kopaei M, Autism, Pathophysiology and promising herbal remedies, Curr Pharm Des, 22(3), 2016, 277–285.

Bahmani M, Shirzad H, Mirhosseini M, Mesripour A, Rafieian-Kopaei M, A Review on Ethnobotanical and Therapeutic Uses of Fenugreek (Trigonella foenum-graceum L), J Evid Based Complementary Altern Med, 2015.

Bahmani M, Shirzad H, Rafieian S, and Rafieian-Kopaei, Silybum marianum M, Beyond Hepatoprotection, Journal of Evidence-Based Complementary & Alternative Medicine, 2015.

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, 7(1), 2014, 43-53.

Bahmani M, Vakili-Saatloo N, Gholami-Ahangaran M, Karamati SA, Khalil-Banihabib E, Hajigholizadeh Gh, A comparison study on the anti-leech effects of onion (Allium cepa L) and ginger (Zingiber officinale) with levamisole and triclabendazole, J Herbmed Pharmacol, 2(1), 2013, 1-3.

Bahmani M, Zargaran A, Rafieian-Kopaei M, Identification of medicinal plants of Urmia for treatment of gastrointestinal disorders, Rev Bras Farmacogn, 24(4), 2014, 448-468.

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, 7(1), 2014, 348-354.

Bahmani M, Rafieian-Kopaei M, Medicinal plants and secondary metabolites for leech control, Asian Pac J Trop Dis, 4(4), 2014, 315-316.

Bahmani, M, Abbasi, J, Mohsenzadegan, A, Sadeghian, S, Gholami-Ahangaran, M, Allium sativum L, the antiammature leech (Limnatis nilotica) activity compared to Niclosomide, Comp Clin Path, 22, 2013,165-168.

Bahmani, M,Shirzad, H,Rafieian, S,Rafieian-Kopaei, M, Silybum marianum, Beyond Hepatoprotection, Journal of Evidence-Based Complementary and Alternative Medicine, 20(4), 2015, 292-301.

Baradaran A, Nasri H, Nematbakhsh M, Rafieian-Kopaei M, Antioxidant activity and preventive effect of aqueous leaf extract of Aloe Vera on gentamicin-induced nephrotoxicity in male Wistar rats, Clinica Terapeutica, 165(1), 2014, 7-11.

Baradaran A, Nasri H, Rafieian-Kopaei M, Comment on, Anti-oxidative stress activity of Stachys lavandulifolia aqueous extract in humans, Cell J, 15(3), 2013, 272-273.

Baradaran A, Rabiei Z, Rafieian M, Shirzad H, A review study on medicinal plants affecting amnesia through cholinergic system, Journal of HerbMed Pharmacology, 1(1), 2012, 3-9.

Baradaran A, Madihi Y, Merrikhi A, Rafieian-Kopaei M, Nematbakhsh M, Asgari, A, Khosravi Z, Haghighian F, Nasri H, Nephrotoxicity of hydroalcoholic extract of Teucrium polium in Wistar rats, Pak J Med Sci, 29(1), 2013, 329-333.

Cho SJ, Rhee DK, Pyo S, Allicin, a major component of garlic, inhibits apoptosis of macrophage in a depleted nutritional state, Nutrition, 22, 2006, 1177-1184.

Dapkhahi Z, Survey of Amirkabiria odoratissima Mozaffarian, Tesis of general PhD Pharmacology Dissertation, Isfahan Univ Med Sci, 2008, 29-54.

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, 7(1), 2014, 376-379.

Delfan B, Bahmani M, Hassanzadazar H, Saki K, Rafieian-Kopaei M, Rashidipour M, Bagheri F and Sharifi A, Ethnobotany study of effective medicinal plants on gastric problems in Lorestan province, West of Iran, Journal of Chemical and Pharmaceutical Research, 7(2), 2015, 483-492.

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, 4(2), 2014, 879-884,

Delfan B, Kazemeini HR and Bahmani M, Identifying Effective Medicinal Plants for Cold in Lorestan Province, West of Iran, Journal of Evidence-Based Complementary & Alternative Medicine, 2015, 1-7.

Ebrahimie M, Bahmani M, Shirzad H, Rafieian-Kopaei M, Saki K, A Review Study on the Effect of Iranian Herbal Medicines on Opioid Withdrawal Syndrome, J Evid Based Complementary Altern Med, 20(4), 2015, 302-309.

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, 21, 2012, 1219-1222.

Forouzan S, Bahmani M, Parsaei P, Mohsenzadegan A, Gholami- Ahangaran M, Anti-parasitic activites of Zingiber officinale methanolic extract on Limnatisnilotica, Glob Vet, 9(2), 2012, 144-148.

Ghaed F, Rafieian-Kopaei M, Nematbakhsh M, Baradaran A,Nasri H, Ameliorative effects of metformin on renal histologic and biochemical alterations of gentamicin-induced renal toxicity in Wistar rats, J Res Med Sci, 17 (7), 2012, 621-625.

Ghasemi Pirbalouti A, Momeni M and 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, **10**(2), 2013.

Hansel R, Tayler VE, Rational phytotherapy, A physicians` guide to herba medicine, 3rd ed, Springer, Berlin, 1998, 107-125.

Heidarian E, Rafieian-Kopaei M, Protective effect of artichoke (Cynara scolymus) leaf extract against lead toxicity in rat, Pharm Biol, 51(9), 2013, 1104-9.

Karamati SA, Hassanzadazar H, Bahmani M, Rafieian-Kopaei M, Herbal and chemical drugs effective on malaria, Asian Pac J Trop Dis, 4(2), 2014, 599-601.

Kasper Dennis L, Braunwald E, Hauser S, LongoD, Jameson JL, Fauci AS, Harrison's principels of internal medicine, 16th edition, New york,McGraw- Hillmedical Publishing Division, 2005, 1746-1762.

Mardani S, Nasri H, Hajian S, Ahmadi A, Kazemi R, Rafieian-Kopaei M, Impact of Momordica charantia extract on kidney function and structure in mice, J Nephropathol, 3(1), 2014, 35-40.

Mirhosseini M, Baradaran A, Rafieian-Kopaei M, Anethum graveolens and hyperlipidemia, A randomized clinical trial, J Res Med Sci, 19, 2014, 758-761.

Moghim H, Taghipoor S, Shahinfard N, Kheiri S, Heydari Z, Rafieian S, Antifungal effects of Allium ascalonicum, Marticaria chamomilla and Stachys lavandulifolia extracts on Candida albicans, J Herbmed Pharmacol, 4(1), 2014, 9-14.

Moradi MT R-KM, Imani-Rastabi Rabiei Z, Alibabaei Z, Antispasmodic effects of yarrow (Achillea millefolium L) extract in the isolated ileum of rat, Afr J Tradit Complement Altern Med, 10(6), 2013, 499-503.

Naghibi F, Mosaddegh M, Mohammadi Motamed S, Ghorbani A, Labiatae Family in folk Medicine in Iran, from Ethnobotany to Pharmacology, Iranian Journal of Pharmaceutical Research, 2, 2005, 63-79.

Nasri H, Ahmadi A, Baradaran A, Momeni A, Nasri P, Mardani S, Rafieian-Kopaei M, Mubarak M, Clinicopathological correlations in lupus nephritis, a single center experience, J Nephropathol, 3(3), 2014, 115-120.

Nasri H, Baradaran A, Ardalan MR, Mardani S, Momeni A, Rafieian-Kopaei M, Bright renoprotective properties of metformin, beyond blood glucose regulatory effects, Iran J Kidney Dis, 7(6), 2013, 423-428.

Nasri H, Nematbakhsh M, Rafieian-Kopaei M, Ethanolic extract of garlic for attenuation of gentamicin-induced nephrotoxicity in Wistar rats, Iran J Kidney Dis, 7(5), 2013, 376-382.

Nasri H, Rafieian-Kopaei M, Tubular kidney protection by antioxidants, Iranian J Publ Health, 42(10), 2013, 1194-1196.

Nasri H, Rafieian-Kopaei M, Medicinal plants and new concerns in statin consumption, Iranian J Publ Health, 42(9), 2013, 1071-1072.

Nasri H, Rafieian-Kopaei M, Protective effects of herbal antioxidants on diabetic kidney disease, J Res Med Sci, 19(1), 2014, 82-83.

Nasri H, Shabnam Hajian Sh, Ahmadi A, Baradaran A, Kohi G, Nasri P, Rafieian-Kopaei M, Ameliorative Effect of Green Tea Against Contrast-induced Renal Tubular Cell Injury, Iran J KID DIS, 9, 2015, 421-426.

Nasri H, Shirzad H, Baradaran A, Rafieian-kopaei M, Antioxidant plants and diabetes mellitus, J Res Med Sci, 20, 2015 ,491-500.

Nasri H, Tavakoli M, Ahmadi A, Baradaran A, Nematbakhsh M, Rafieian-Kopaei M, Ameliorative effect of melatonin against contrast media induced renal tubular cell injury, Pak J Med Sci, 30(2), 2014, 261-265.

Oganesvan G B, Galstyan AM, Mnatsakanyan VA, Paronikyan RV, Ter-Zakharyan Yu Z, Phenolic and flavonoid compounds of Ziziphora clinopodioides, Chemistry of Natural Compounds, 27(2), 1991, 247.

Pan JS, He SZ, Xu HZ, Oxidative stress disturbs energy metabolism of mitochondria in ethanol-induced gastric mucosa injury, World J Gastroenterol, 14, 2008, 5857–5867.

Parsaei P, Karimi M, Asadi SY, Rafieian-Kopaei M, Bioactive components and preventive effect of green tea (Camellia sinensis) extract on postlaparotomy intra-abdominal adhesion in rats, Int J Surg, 08, 2013, 014.

Rabiei Z, Hojjati M, Rafieian-Kopaeia M, Alibabaei Z, Effect of Cyperus rotundus tubers ethanolic extract on learning and memory in animal model of Alzheimer, Biomedicine & Aging Pathology, 3(4), 2013, 185-191.

Rabiei Z, Rafieian M, Effects of Zizyphus jujuba Extract on Motor Coordination Impairment Induced by Bilateral Electric Lesions of the Nucleus Basalis of Meynert in Rat, Physiology and Pharmacology, 17(4), 2014, 469-477.

Rabiei Z, Rafieian-kopaei M, Heidarian E, Saghaei E, Mokhtari S, Effects of zizyphus jujube extract on memory and learning impairment induced by bilateral electric lesions of the nucleus basalis of meynert in rat, Neurochemical research, 39(2), 2014, 353-360.

Rabiei Z, Rafieian-Kopaei M, Mokhtari S, Alibabaei Z, Shahrani M, The effect of pretreatment with different doses of Lavandula officinalis ethanolic extract on memory, learning and nociception, Biomedicine & Aging Pathology, 4(1), 2014, 71-76.

Rabiei Z, Rafieian-Kopaei M, Neuroprotective effect of pretreatment with Lavandula officinalis ethanolic extract on blood-brain barrier permeability in a rat stroke model, Asian Pacific journal of tropical medicine, 7, 2014, S421-S426.

Rafieian-Kopaei M, Asgary S, Adelnia A, Setorki M, Khazaei M, Kazemi S, Shamsi F, The effects of cornelian cherry on atherosclerosis and atherogenic factors in hypercholesterolemic rabbits, J Med Plants Res, 5(13), 2011, 2670-2676.

Rafieian-Kopaei M, Baradaran A, Merrikhi A, Nematbakhsh M, Madihi Y, Nasri H, Efficacy of Co-Administration of garlic extract and metformin for prevention of gentamicin-renal toxicity in wistar rats, A biochemical study, International Journal of Preventive Medicine, 4(3), 2013, 258-264.

Rafieian-kopaei M, Keshvari M, Asgary S, Salimi M, Heidarian E, Potential role of a nutraceutical spice (Allium hirtifolium) in reduction of atherosclerotic plaques, J Herbmed Pharmacol, 2(2), 2013, 23-28.

Rafieian-Kopaei M, Nasri H, Re, Erythropoietin ameliorates oxidative stress and tissue injury following renal ischemia/reperfusion in rat kidney and lung, Med Princ Pract, 23(1), 2014, 95.

Rafieian-Kopaei M, Nasri H, The Ameliorative Effect of Zingiber officinale in Diabetic Nephropathy, Iran Red Crescent Med J, 16(5), 2014, e11324.

Rafieian-Kopaei M, Setorki M, Doudi M, Baradaran A, Nasri H, Atherosclerosis, Process, Indicators, Risk Factors and New Hopes, Int J Prev Med, 5, 2014, 927-946.

Rafieian-Kopaei M, Shahinfard N, Rouhi-Boroujeni H, Gharipour M, Darvishzadeh-Boroujeni P, Effects of Ferulago angulata extract on serum lipids and lipid peroxidation, Evidence-Based Complementary and Alternative Medicine, Article ID 680856, 4 pages 2014, http,//dx,doi,org/10,1155/2014/680856.

Rafieian-Kopaei, M,Hosseini, M,Shirzad, H, Comment on, Effect of pomegranate flower extract on cisplatin-induced nephrotoxicity in rats, Journal of Nephropathology, 3(4), 2014, 121-123.

Rahimian G, Sanei MH, Shirzad H, Azadegan-Dehkordi F, Taghikhani A, Salimzadeh L, Virulence factors of Helicobacter pylori vacA increase markedly gastric mucosal TGF-beta1 mRNA expression in gastritis patients, Microbial pathogenesis, 2014, 67-68.

Rahimian G.A, Rabiei Z, Tahmasebi B, Rafieian-Kopaei M, Ganji F, Rahimian R, Comparing the Combined Effect of Garlic and Mint Extract with Metronidazole in Helicobacter Pylori Treatment, Iranian Journal of Pharmaceutical Sciences, 9(3), 2013,63-70.

Rahnama S, Rabiei Z, Alibabaei Z, Mokhtari S, Rafieian-kopaei M, Deris F, Anti-amnesic activity of Citrus aurantium flowers extract against scopolamine-induced memory impairments in rats, Neurological Sciences, 36(4), 2015, 553-60.

Razavi A, Bagheri N, Azadegan-Dehkordi F, Shirzad M, Rahimian G, Rafieian-Kopaei M, Comparative Immune Response in Children and Adults with H, pylori Infection, Journal of Immunology Research, 2015, 315957.

Saki K, Bahmani M, Rafieian-Kopaei M, Hassanzadazar H, Dehghan K,Bahmani F, Asadzadeh J, The most common native medicinal plants used for psychiatric and neurological disorders in Urmia city, northwest of Iran, Asian Pac J Trop Dis, 4(2), 2014, 895-901.

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, 7(1), 2014, 34-42.

Salehi P, Sonboli A, Eftekhar F, Nejad-Ebrahimi S, Yousefzadi M, Essential oil composition, antibacterial and antioxidant activity of the oil and various extracts of Ziziphora clinopodioides subsp, rigida (BOISS,) RECH, f, from Iran, Biol Pharm Bull, 28(10), 2005,1892-1896.

Salimzadeh L, Bagheri N, Zamanzad B, Azadegan-Dehkordi F, Rahimian G, Hashemzadeh-Chaleshtori M, Frequency of virulence factors in Helicobacter pylori-infected patients with gastritis, Microbial pathogenesis, 80, 2015, 67-72.

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, 22(2), 2016, 238–246.

Setorki M, Rafieian-Kopaei M, Merikhi A, Heidarian E, Shahinfard N, Ansari R, Nasri H, Esmael N, Baradaran A, Suppressive impact of anethum graveolens consumption on biochemical risk factors of atherosclerosis in hypercholesterolemic rabbits, Int J Prev Med, 4(8), 2013, 889-895.

Sharafati R, Sharafati F, Rafieian-kopaei M, Biological characterization of Iranian walnut (Juglans regia) leaves, Turk J Biol, 2011,635-639.

Shayganni E, Bahmani M, Asgary S, Rafieian-Kopaei M, Inflammaging and cardiovascular disease, management by medicinal plants, Phytomedicine, 2015.

Shirani M, Alibabaei Z, Kheiri S, Shirzad H, Taji F, Asgari A, Rafieian M, Effect of Euphorbia helioscopia extract on acute and chronic pain in mice Journal of Babol University of Medical Sciences, 13(4), 2011,14-18.

Shirzad H, Bagheri N, Azadegan-Dehkordi F, Zamanzad B, Izadpanah E, Abdi M, New insight to IL-23/IL-17 axis in Iranian infected adult patients with gastritis, effects of genes polymorphisms on expression of cytokines, Acta Gastroenterol Belg, 78, 2015, 212-218.

Shirzad H, Shahrani M, Rafieian-Kopaei M, Comparison of morphine and tramadol effects on phagocytic activity of mice peritoneal phagocytes in vivo, Int Immunopharmacol, 2009, 9(7-8),968-970.

Shirzad H, Taji F, Rafieian-Kopaei M, Correlation between antioxidant activity of garlic extracts and WEHI-164 fibrosarcoma tumor growth in BALB/c mice, J Med Food, 14(9), 2011, 969-974.

Sonboli A, Mirjalili MH, Hadian J, Ebrahimi SN, Yousefzadi M, Antibacterial activity and composition of the essential oil of Ziziphora clinopodioides subsp, bungeana (Juz,) Rech, f, from Iran, Z Naturforsch, 61(9-10), 2006, 677-680.

Taghikhani A, Afrough H, Ansari-Samani R, Shahinfard N, Rafieian-Kopaei M, Assessing the toxic effects of hydroalcoholic extract of Stachys lavandulifolia Vahl on rat's liver, Bratisl Lek Listy, 115(3), 2014, 121-124.

Taghikhani M, Nasri H, Asgari A, Afrough H, Namjoo AR, Ansari-Samani R, Shahinfard N, Rafieian-kopaei M, The renal toxicity of hydroalcoholic extract of Stachys lavandulifolia Vahl in Wistar rats, Life Sci J, 9(4), 2012, 3025-3031.

Zandi F, Shirzad H, Bagheri N, Ahmadi A, Azadegan F, Gharib A, Evaluation of IL-17A and IL-17F genes polymorphism in Iranian dyspeptic patients, Life Science Journal, 10, 2013, 544-551.

Zandi F, Shirzad H, Bagheri N, Rahimian G, Salimzadeh L, Azadegan F, Evaluation of H, pylori Infection and IL23R Gene Polymorphism in Dyspeptic Subjects, Life Science Journal, 2014,11.

Zargari A, Iranian Medicinal Plants, Tehran,Tehran University Press, 5th edition, 4, 1997, 103-104.