



# Constipation: An ethno-botanical study of medicinal plants used for constipation in Shahrekord city, Chaharmahal & Bakhtiari province, Iran

Nima Karami<sup>1</sup>, Mohammad Karimi<sup>2</sup>, Mahmoud Bahmani<sup>3\*</sup>

<sup>1</sup>Medical Plants Research Center, Basic Health Sciences Institute, Shahrekord University of Medical Sciences, Shahrekord, Iran

<sup>2</sup>Infectious Disease Specialist, Babol University of Medical Sciences, Babol, Iran

<sup>3</sup>Biotechnology and Medicinal Plants Research Center, Ilam University of Medical Sciences, Ilam, Iran

## \*Correspondence to:

Dr. Mahmoud Bahmani mahmood.bahmani@gmail.com

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## Abstract

Constipation is a common gastrointestinal problem in society, both in children and in adults, which imposes stupendous costs on society. For centuries, people have used medicinal plants, herbal teas, and teas to relieve digestive problems, including to stimulate the digestive system and reduce constipation. Therefore, in this study we sought to investigate the indigenous and ethnobotanical knowledge regarding constipation in children and infants in Sharekord. The present ethnobotanical study was carried out through a questionnaire in Shahrekord. This study was conducted from April 2017 to February 2018 through face-to-face interviews and a questionnaire among 29 traditional therapists. The results of this study showed that medicinal plants such as *Descurainia sophia* (L.) Prantle., *Rumex pulcher* L., *Alyssum spp.* Stead. Ex Boiss., *Prunus amygdalus* L., *Astragalus adscendens* Bioss. & Hausskn., *Echinops persicus* Stev. & Fisch., *Plantago major* L., *Rheum ribes* L., *Stachys lavandulifolia*, *Plantago major*, *Alcea spp.*, *Glycyrrhiza glabra* L., *Peganum harmala* L., *Pistachia atlanta* Desf. and *Prangos ferulacea* L. are traditionally used to treat constipation in children and infants.

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## Introduction

Constipation refers to delayed or difficulty passing of stools that lasts two weeks or more. The diagnosis of constipation depends on the consistency of the stool, the frequency of bowel movements, and difficulty in passing stools [1].

Constipation is a common gastrointestinal problem in society, both in children and adults, which imposes stupendous costs on society [2-5]. Constipation is a symptom, not a disease [6]. The actual prevalence of this problem in children is unknown, but various studies at the community level have shown that its prevalence is between 10-20% in adults and 0.7-29.6% in children in Western and Asian countries [7-9]. Constipation accounts for 3-5% of the referrals to pediatricians, and one third of children aged 6 to 12 years old have constipation at least once a year. Ninety five percent of children who are examined for constipation do not have an underlying pathology [10-12]. Children with constipation typically have less appetite and little fiber intake. Gastroesophageal reflux disease manifests as short, limited, and asymptomatic gastric contents flowing back to the esophagus, which is common in infancy, especially in the first six

months of life [13]. Studies have shown that constipation is due to reasons such as the lack of taking adequate amounts of fluids, especially water, during physical activity or in hot areas, ignoring the urge for bowel movements due to not wanting to have their play interrupted by a trip to the bathroom and gradual decrease in colonic motility, a change in living place or travel, the fear of the toilet environment, the disruption of the normal and everyday order of life, the beginning of schooling and the inability to use the school's toilets and the consumption of some drugs [14,15]. Treatments for constipation include osmotic drugs, selective drugs, stimulant laxatives, fibrous drugs, fiber-rich diets, and stool-enlarging drugs [16]. Ethnobotany can provide ideas for modern pharmacology, and many medicinal plants that have been introduced in ethnobotany have been shown to be effective in experimental pharmacology as well [17-21].

For centuries, people have used medicinal plants, herbal teas, and teas to relieve digestive problems, including stimulating the digestive system and reducing constipation. Constipation is one of the most common problems for which people are seeking out a plant-based de-

finitive treatment for it. It is easy to find herbal drugs for constipation. In fact, most of over-the-counter laxatives contain herbal compounds. Many laxative plants contain anthraquins or induce bowel movement. These laxatives act by absorbing fluid into the intestine and increasing bowel movement. The bowel movement helps the stool passes out of the body.

It is essential to add fiber and fluids to the diet of people suffering from constipation. In this study, we sought to investigate the indigenous and ethnobotanical knowledge regarding constipation of children and infants in Shahrekord.

## Methods

### Area of study

Shahrekord city is located southwest of Iran. Shahrekord is the capital of Chaharmahal & Bakhtiari province in Iran. Shahrekord has a population of 169199 people. The language of the people is Persian (Farsi). The Main job of people is agriculture and animal husbandry. The map of Shahrekord city is indicated in figure 1.



Figure 1. Map of Shahrekord in Chaharmahal & Bakhtiari province

### Data collection procedure

The present ethnobotanical study was carried out using a questionnaire in Shahrekord. This study was conducted from April 2017 to February 2018 through face-to-face interviews using a questionnaire in 29 traditional therapists. The questionnaires that also included demographic characteristics items were distributed among traditional therapists. The interviewers referred to the therapists in person to elicit their pharmaceutical information and beliefs about phytotherapy. Out of 29 therapists, 8 were female and 21 male. Their level of education was from high school diploma to master's degree. The results of the questionnaires were meticulously tabulated. Data analysis was done by the Excel software. In this study, the frequency of plant use was calculated by the following formula:

Number of times the plant is used = (Number of people who have mentioned the plant effect divided by total number of people who filled out questionnaires)  $\times$  100




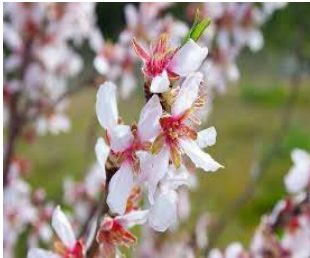


### Results

The results of this study showed that medicinal plants such as *Salvia hispanica*, *Descurainia sophia* (L.) Prantle., *Prunus amygdalus* L., *Echinops persicus* Stev. & Fisch., *Stachys lavandulifolia* and some other herb are traditionally used to treat constipation. Additional information is shown in Table 1. Figure, frequency of rate, number of plant organs used, and number of plant families with anti-constipation effect are indicated in Tables 2–4.







Table 1. Ethnobotanical data on constipation drugs for infants and children in Shahrekord

Scientific name	Herbal name	Local name	Used organs	Effect
<i>Salvia hispanica</i>	Lamiaceae	Tokhmsharbat	Seed	Anti-constipation
<i>Descurainia sophia</i> (L.) Prantle.	Brassicaceae	Khakeshir	Seed	Anti-constipation
<i>Rumex pulcher</i> L.	Polygonaceae	Torshak	Leaf, root, stem, flower	Anti-constipation
<i>Alyssum</i> spp. Stead. Ex Boiss.	Brassicaceae	Ghodoumeh	Leaf, seed	Anti-constipation
<i>Prunus amygdalus</i> L.	Rosaceae	Badam	Fruit, resin	Anti-constipation
<i>Astragalus adscendens</i> Bross. & Hausskn.	Fabaceae	Gazangabin	Resin	Anti-constipation
<i>Echinops persicus</i> Stev. & Fisch.	Asteraceae	Shekartiqal	Fruit	Anti-constipation
<i>Plantago major</i> L.	Plantaginaceae	Esfarzeh	Seed	Anti-constipation
<i>Rheum ribes</i> L.	Polygonaceae	Rivas	Leaf, flower, stem	Anti-constipation
<i>Stachys lavandulifolia</i>	Lamiaceae	Chaye kouhi	Aerial organs	Anti-constipation
<i>Plantago major</i>	Plantaginaceae	Barhang	Aerial organs	Anti-constipation
<i>Alcea</i> spp.	Malvaceae	Gole khatmi	Flower	Anti-constipation
<i>Glycyrrhiza glabra</i> L.	Fabaceae	Shirin bayan	Root	Anti-constipation
<i>Peganum harmala</i> L.	Zygophyllaceae	Espand	Seed, leaf	Anti-constipation
<i>Pistachia atlanta</i> Desf.	Anacardiaceae	Pesteye kouhi	Fruit	Anti-constipation
<i>Prangos ferulacea</i> L.	Apiaceae	Jashir	Aerial organs	Anti-constipation

**Table 2.** Figure of medicinal plants and frequency rate

Frequency rate	Figure	Scientific name
<i>Ocimum basilicum</i>		3%
<i>Descurainia sophia</i> (L.) Prantle.		13%
<i>Rumex pulcher</i> L.		3%
<i>Prunus amygdalus</i> L.		3%
<i>Astragalus adscendens</i> Bross. & Hausskn.		3%
<i>Echinops persicus</i> Stev. & Fisch.		13%



Frequency rate	Figure	Scientific name
<i>Plantago major</i> L.		34%
<i>Rheum ribes</i> L.		6%
<i>Stachys lavandulifolia</i>		10%
<i>Plantago major</i>		10%
<i>Glycyrrhiza glabra</i> L.		17%
<i>Peganum harmala</i> L.		6%



Frequency rate	Figure	Scientific name
<i>Pistachia atlanta</i> Desf.		3%
<i>Prangos ferulacea</i> L.		3%

Table 3. Number of herbal family

Scientific name	Herbal name
Lamiaceae	2
Brassicaceae	2
Polygonaceae	2
Rosaceae	1
Fabaceae	2
Asteraceae	1
Plantaginaceae	2
Malvaceae	1
Zygophyllaceae	1
Anacardiaceae	1
Apiaceae	1

Table 4. Number of plant organs used

Used organs	Number
Seed	5
Leaves	4
Root	2
Stem	2
Flower	3
Fruit	3
Aerial organs	3
Resin	1
Oil	1

## Discussion

Constipation, characterized by various bowel symptoms including having hard stool, difficulties in passing stool and an unpleasant feeling of incomplete stool evacuation, is an unpleasant problem that can make life bitter and annoying. When one has constipation and is suffering from flatulence, the only thing he/she thinks is a quick recovery. Individuals may develop constipation in different ways depending on their physical system. Various causes of constipation usually limit its clinical efficacy of the conventional treatments. Medicinal plant usually have mul-

tifunction properties [22-28]. The shortcomings of the current treatments can be completed by medicinal plants which not only are able to target multiple organs of the body but also can reduce their toxic effects [29-33]. Most laxative medicinal plants have substances such as anthraquinones which stimulate the intestines. A laxative usually works by drawing in fluid to colon and enhancing peristalsis which is intestinal contraction helping the motivation of materials through the colon to the rectum. The use of fluids and fiber is essential to remove constipation. Medicinal plants usually have high level of fluid and fiber which can help these patients. Chronic constipation increases the body level of

oxidative stress [34]. Oxidative stress is one of the causes of a wide range of diseases [35-43]. Therefore, patients with constipation who suffer from other diseases may benefit further from these plants. It should be noted that medicinal plants have been used since ancient times and their safety a lot of them has been approved [44]. However, they also should be used with caution because they may have toxic effects, although they may even reduce the toxic effects of other compounds [45-48].

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## Authors' contribution

All authors contributed equally to the manuscript.

## Conflicts of interest

The authors declared no competing interests.

## Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication and etc.) have been completely observed by author.

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## References

- Rubin G. Constipation in children. *Clin Evid*. 2003; 10: 369-374.
- Loening-Baucke V. Chronic constipation in children. *Gastroenterol*. 1993; 105(5): 1557-64.
- Benninga MA, Voskuil WP, Taminiau JA. Childhood constipation: is there new light in the tunnel? *J Pediatr Gastroenterol Nutr*. 2004; 39 (5): 448-64.
- Agnarsson U, Warde C, McCarthy G, Evans N. Perianal appearances associated with constipation. *Arch Dis Child*. 1990; 65(11):1231-4.
- Kliegman RM, Behrman RE, Jenson HB, Stanton B, (eds). *Nelson textbook of Pediatric*. 18th. ed. USA: Saunders; 2007: 1564-8.
- Benninga M, Candy DC, Catto-Smith AG, Clayden G, Loening-Baucke V, Di Lorenzo C, et al. The Paris Consensus on Childhood Constipation Terminology (PACCT) Group. *J Pediatr Gastroenterol Nutr*. 2005; 40(3): 273-5.
- Loening-Baucke V. Prevalence, symptoms and outcome of constipation in infants and toddlers. *J Pediatr*. 2005; 146(3): 359-63.
- Ip KS, Lee WT, Chan JS, Young BW. A community-based study of the prevalence of constipation in young children and the role of dietary fibre. *Hong Kong Med J*. 2005; 11(6): 431-6.
- Miele E, Simeone D, Marino A, Greco L, Auricchio R, Novek SJ, et al. Functional gastrointestinal disorders in children: an Italian prospective survey. *Pediatrics*. 2004; 114(1):73-8
- Khanna V, Poddar U, Yachha SK. Etiology and clinical spectrum of constipation in Indian children. *Indian Pediatr*. 2010; 47(12):1025-30.
- Farnam A, Rafeey M, Farhang S, Khodjastejafari S. Functional constipation in children: does maternal personality matter? *Ital J Pediatr*. 2009; 35(1): 25.
- Drossman DA, Dumitrascu DL. Rome III: New standard for functional gastrointestinal disorders. *J Gastrointest Liver Dis*. 2006; 15(3): 237-41.
- Vandenplas Y. Gastroesophageal reflux. In: Hyams WR, editor. *Pediatric Gastrointestinal and Liver Disease*. 3rd ed. Philadelphia, PA: Saunders Elsevier; 2006; 306-25.
- Carroccio A, Iacono G. Review article: Chronic constipation and food hypersensitivity--an intriguing relationship. *Aliment Pharmacol Ther*. 2006; 24(9): 1295-304.
- Afzal NA, Tighe MP, Thomson MA. Constipation in children. *Ital J Pediatr*. 2011; 37: 28.
- Pashankar DS. Childhood Constipation: Evaluation and Management. *Clin Colon Rectal Surg*. 2005; 18: 120-7.
- Bahmani M, Mozaffari Nejad AS, Shah NA, Shah SA, Rafieian-Kopaei M, Mahmoodnia L. Survey on ethnobotanical uses of anti-cancer herbs in Southern region of Ilam, West Iran. *J Biolog Res*. 90 (1). <https://doi.org/10.4081/jbr.2017.5939>
- Delfani, S., Bahmani, M., Mohammadrezaei-Khorramabadi, R., Rafieian-Kopaei, M. Phytotherapy in Streptococcus agalactiae: An overview of the medicinal plants effective against Streptococcus agalactiae. *J Clin Diagn Res*. 2017; 11(6): 01-02.
- Rafieian-kopaei M, Shakiba A, Sedighi M, Bahmani M. The Analgesic and Anti-Inflammatory Activity of Linum usitatissimum in Balb/c Mice. *J Evid Based Complementary Altern Med*. 2017; 22(4):892-896.
- Asadi N, Husseini SD, Tohidian MT, Abdali N, Mimandipoure A, Rafieian-Kopaei M, Bahmani M. Performance of Broilers Supplemented With Peppermint (*Mentha piperita* L.) Powder. *J Evid Based Complementary Altern Med*. 2017; 22(4):703-706.
- Alizadeh M, Safarzadeh A, Bahmani M, Beyranvand F, Mohammadi M, Azarbaijani K, Rafieian-Kopaei M, Abbaszadeh S. Brucellosis: Pathophysiology and new promising treatments with medicinal plants and natural antioxidants. *Asian Pac J Trop Med*. 2018; 11: 597-608.
- Nazarian-Samani Z, Sewell RD, Lorigooini Z, Rafieian-Kopaei M. Medicinal plants with multiple effects on diabetes mellitus and its complications: A Systematic review. *Current Diab Rep*. 2018; 1; 18(10): 72.
- Rouhi-Boroujeni H, Heidarian E, Rouhi-Boroujeni H, Deris F, Rafieian-Kopaei M. Medicinal Plants with Multiple Effects on Cardiovascular Diseases: A Systematic Review. *Current Pharmaceutical Design*. 2017; 23(7): 999-1015.
- Hosseini Z, Lorigooini Z, Rafieian-Kopaei M, Shirmardi HA, Solati K. A review of botany and pharmacological effect and chemical composition of Echinophora species growing in Iran. *Pharmacog Res*. 2017; 9(4): 305.
- Bahmani M, Zargarani A, Rafieian-Kopaei M. Identification of medicinal plants of Urmia for treatment of gastrointestinal disorders. *Revista Brasileira De Farmacognosia-Brazilian J Pharmacog*. 2014; 24(4): 468-80.
- Rahimi-Madiseh M, Lorigooini Z, Zamani-Gharaghosh H, Rafieian-kopaei M. Berberis vulgaris: specifications and traditional uses. *Iranian J Basic Med Sci*. 2017; 20(5): 569-87.
- Torki A, Khalaji-Pirbalouty V, Lorigooini Z, Rafieian-Kopaei M, Sadeghimanesh A, Rabiei Z. Anchusa italica extract: phytochemical and neuroprotective evaluation on global cerebral ischemia and reperfusion. *Brazilian J Pharmac Sci*. 2018; 54(1). <http://dx.doi.org/10.1590/s2175-97902018000117251>.
- Tamri P. A mini-review on phytochemistry and pharmacological activities of Scrophularia striata. *J Herbmed Pharma-*

- col. 2019; 8(2):85-89.
29. Mehrandish R, Rahimian A, Shahriary A. Heavy metals detoxification: A review of herbal compounds for chelation therapy in heavy metals toxicity. *J Herbmed Pharmacol*. 2019; 8(2): 69-77.
  30. Pirzad Jahromi G, Imani E, Nasehi M, Shahriari A. Effect of *Achillea millefolium* aqueous extract on memory deficit and anxiety caused by stroke in ovariectomized rats. *J Herbmed Pharmacol*. 2019; 8(2):153-159.
  31. Ghaderi H, Rafieian M, Nezhad HR. Effect of hydroalcoholic *Cinnamomum zeylanicum* extract on reserpine-induced depression symptoms in mice. *Pharmacophore*. 2018; 9(2): 35-44.
  32. Talei GR, Mohammadi M, Bahmani M, Kopaei MR. Synergistic effect of *Carum copticum* and *Mentha piperita* essential oils with ciprofloxacin, vancomycin, and gentamicin on Gram-negative and Gram-positive bacteria. *International J Pharmaceutical Investigation*. 2017; 7(2): 82-7.
  33. Estuningtyas A, Wahyuni T, Wahidiyat PA, Poerwaningsih EH, Freisleben HJ. Mangiferin and mangiferin-containing leaf extract from *Mangifera foetida* L for therapeutic attenuation of experimentally induced iron overload in a rat mode. *J Herbmed Pharmacol*. 2018; 9(1): 21-27.
  34. Jun-Fu Z, Jian-Guo L, Sheng-Li Z, Ji-Yue W. Potential oxidative stress in children with chronic constipation. *World J Gastroenterol*. 2005; 21; 11(3): 368-371.
  35. Karimi A, Mohammadi-Kamalabadi M, Rafieian-Kopaei M, Amjad L, Salimzadeh I. Determination of antioxidant activity, phenolic contents and antiviral potential of methanol extract of *Euphorbia spinidens* Bornm (Euphorbiaceae). *Tropical J Pharmac Res*. 2016; 15(4): 759-64.
  36. Sarrafchi A, Bahmani M, Shirzad H, Rafieian-Kopaei M. Oxidative Stress and Parkinson's Disease: New Hopes in Treatment with Herbal Antioxidants. *Current Pharmaceutical Design*. 2016; 22(2):238-46.
  37. Bahmani M, Sarrafchi A, Shirzad H, Rafieian-Kopaei M. Autism: Pathophysiology and Promising Herbal Remedies. *Current Pharmaceutical Design*. 2016; 22(3): 277-85.
  38. Shaygani E, Bahmani M, Asgary S, Rafieian-Kopaei M. Inflammaging and cardiovascular disease: Management by medicinal plants. *Phytomed*. 2016; 23(11): 1119-26.
  39. Nouri A, Heidarian E. Nephroprotective effect of silymarin against diclofenac-induced renal damage and oxidative stress in male rats. *J Herbmed Pharmacol*. 2019; 8(2):146-152.
  40. Asgharzade S, Rafieian-kopaei M, Mirzaeian A, Reisi S, Salimzadeh L. Aloe vera toxic effects: expression of inducible nitric oxide synthase (iNOS) in testis of Wistar rat. *Iranian J Basic Med Sci*. 2015; 18(10): 967-73.
  41. Valipour Chahardahcharic S, Setorki M. The effect of hydroalcoholic extract of *Crataegus monogyna* on hyperglycemia, oxidative stress and pancreatic tissue damage in streptozotocin-induced diabetic rats. *J Herbmed Pharmacol*. 2018; 7(4):294-299..
  42. Kazemi S, Shirzad H, Rafieian-Kopaei M. Recent Findings in Molecular Basis of Inflammation and Anti-inflammatory Plants. *Current Pharmaceutical Design*. 2018; 24(14):1551-62.
  43. Saffari-Chaleshtori J, Shafiee SM, Ghatreh-Samani K, Jalilian N. The study of drug resistance properties of ABCG2 (ATP-binding cassette G2) in contact with thymoquinone, gallic acid, and hesperetin antioxidants. *J Herbmed Pharmacol*. 2019; 82:108-113.
  44. Jamshidi-Kia F, Lorigooini Z, Amini-Khoei H. Medicinal plants: past history and future perspective. *J Herbmed Pharmacol*. 2018; 7(1):1-7.
  45. Rabiei Z, Lorigooini Z, Rafieian-Kopaei M. Effects of hydroalcoholic extract of *Borago officinalis* on naloxone-precipitated withdrawal syndrome in morphine-dependent mice. *Bangladesh J Pharmacol*. 2016; 11(4): 824-9.
  46. Fathinezhad Z, Sewell RDE, Lorigooini Z, Rafieian-Kopaei M. Depression and treatment with effective herbs. *Curr Pharm Des*. 2019 Apr 1. doi: 10.2174/1381612825666190402105803.
  47. Hosseini Z, Lorigooini Z, Rafieian-Kopaei M, Shirmardi HA, Solati K. A review of botany and pharmacological effect and chemical composition of *Echinophora* species growing in Iran. *Pharmacog Res*. 2017; 9(4): 305.
  48. Moradi F, Sewell RDE, Lorigooini Z, Rafieian-Kopaei M. Immunosuppression-lipid Metabolism Interplay and Medicinal Plants in Atherosclerosis: A Review. *Current Pharmaceutical Design*. 2018; 24:1-5.