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Ethnobotanical Study of Effective Medicinal Plants as Laxative (Anti-constipation): A Case Study in Arasbaran Forests, Northwest Iran

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ABSTRACT

Introduction: Constipation is recognized as a common gastrointestinal problem that many sick and healthy individuals suffer from. Laxative therapy is a reliable way to treat constipation. Several medicinal plants exert laxative potential. Hence, we decided to identify medicinal plants with laxative properties in Arasbaran Forests, East Azerbaijan Province, Northwest Iran.

Methods: This ethnobotanical study was conducted in Arasbaran Forests, East Azerbaijan Province, and Northwest Iran from October 2022 to December 2022. Questionnaires were distributed among 20 traditional medicine doctors and finally, traditional information on the therapeutic effect of medicinal plants was collected through interviews. Demographic information from indigenous people who have traditional botanical knowledge was also collected. Eventually, the data were analyzed.

Results: Our work revealed that thirteen medicinal herbs from 11 herbal families have potent laxative effects. The Berberidaceae, Equisetaceae, Caprifoliaceae, Celasteraceae, Asteraceae, Cucurbitaceae, Euphorbiaceae, Grossulariaceae, Polygonacea, Polypodiaceae, and Rosaceae families had laxative effects. Fruit, leaves, aerial parts, bark, root, and rhizome were the most effective parts, respectively. These medicinal plants were administrated in decoction and fresh form.

Conclusion: The findings show the traditional laxative effects of medicinal plants against constipation in this region, which have traditional uses. Therefore, identifying the phytochemical constituents of these plants and understanding the mechanism of their laxative effect can be helpful.

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Intorduction

Constipation is a common complication that a wide range of healthy and sick people suffer from (Daniali et al., 2020). It has been estimated that constipation has a high prevalence equal to 16% all over the world. However, statistics from Western industrial countries show prevalence of constipation near 30% (Salari et al., 2023; Klaschik et al., 2003). Constipation is a phenomenon that is experienced by the majority of people throughout their lives at least one time, regardless of age or health status (Salari et al., 2023). There are many causes, including diseases, lifestyle and the use of drugs such as narcotics, in the occurrence of constipation (Klaschik et al., 2003; Xu et al., 2021). Constipation could be an emergency condition that may lead to serious gastrointestinal complications such as hemorrhoids, anal fissure, rectal bleeding, and rectal prolapse eventually (Faghihi et al. 2022). Constipation is an unpleasant condition that needs appropriate assessment and immediate treatment. Constipation treatment is a multi-method process that requires changes in behavior, lifestyle, nutritional status and drug therapy with laxatives for faster and more stable treatment (Camilleri et al., 2017). Changing the behavior, lifestyle and nutritional status of a person with constipation through increasing physical activity, increasing fluid intake, increasing consumption of vegetables and fiber-rich foods are effective approaches in managing constipation (Klaschik et al., 2003). Laxative therapy is the selective pharmacotherapy of constipation. Bulk-forming laxatives, stimulant laxatives, osmotic laxatives, and lubricating agents are most common used laxatives agents to treat constipation (Bassotti et al., 2023). The numerous side effects of synthetic laxatives have increased the desire of researchers to use natural alternatives (Khan et al., 2020). Previous studies have demonstrated the beneficial effects of medicinal plants on constipation. Medicinal plants are well known for their various therapeutic effects including antioxidant, antimicrobial and anti-inflammatory properties (Sulaiman et al., 2022; Amiri et al., 2023; Zangeneh et al., 2023; Baharvand Ahmadi et al., 2023; khajehpour A, Javadian, 2020). In addition to the use of medicinal plants as remedies, they have been recognized as a reliable food sources. Medicinal herbs can improve health status because of their phytochemical constituents. For instance, it has been reported that medicinal plants relieve constipation because they are rich in fiber (Sharma et al., 2021; Jasim et al. 2023; Eftekhari et al., 2022; Baniesmaeeili et al. 2023). Hence, the aim of this study was to identify effective medicinal plants as laxative in Arasbaran Forests, East Azerbaijan Province, and Northwest Iran.

Materials and Methods

Area of Study

The present ethnobotanical study was performed in Arasbaran Forests, East Azerbaijan Province, Northwest Iran.

Data Collection

The current study was a cross-sectional systematic and ethnobotanical research that was conducted in the period from February 2021 to May 2021. First, standard questionnaires were prepared and these questionnaires were administered to 20 traditional medicine doctors (five women and 15 men). The questionnaire was distributed among traditional medicine doctors. The results obtained from the traditional information of the studied subjects were recorded directly in the questionnaire tables and finally the data were analyzed using Excel software (Baharvand Ahmadi et al., 2015).

Results

Our findings highlighted that 13 medicinal herbs from eleven families were administered as laxative (Table 1). It has also been shown that the medicinal herbs in Berberidaceae, Equisetaceae, Caprifoliaceae, Celasteraceae, Asteraceae, Cucurbitaceae, Euphorbiaceae, Grossulariaceae, Polygonacea, Polypodiaceae, and Rosaceae families were laxative (Table 2). Moreover, it has been understood that fruit (41%), leaves (23%), aerial parts (6%), bark (6%), root (18%), and rhizome (6%) were the most usable part of medicinal plants (Figure 1). In addition, it has been observed that decoction (77%) and infusion (23%) were the most important types of preparation methods of the medicinal plants, respectively (Figure 2).

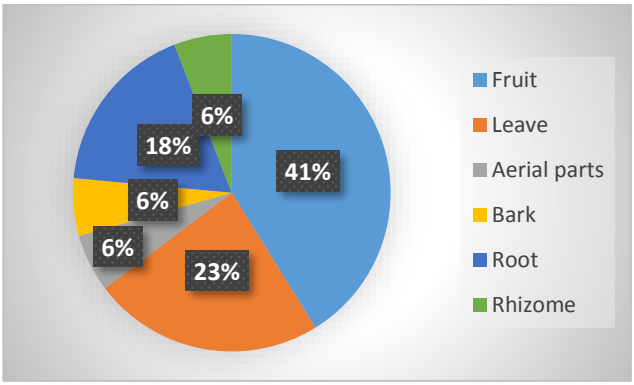

Figure 1. The percentage of plant organs used traditionally as laxative in Arasbaran forests

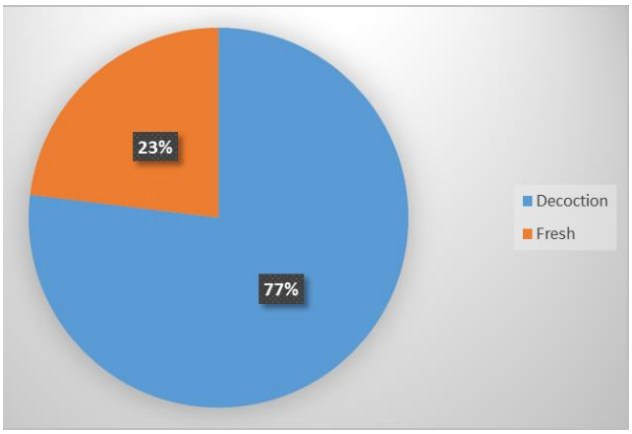

Figure 2. The percentage of traditional used forms of medicinal plants in Arasbaran forests as laxative

Table 1. Medicinal plants used as laxatives in Arasbaran, Iran

Scientific Name	Family	Persian Name	Usable Part of Plant	Preparation Methods	N	%
Berberis vulgaris L.	Berberidaceae	Zereshk	Fruit & leave	Decoction	8	53.33
Equisetum arvense L.	Equisetaceae	Dome asb	Aerial parts	Decoction	7	46.66
Sambucus nigra L.	Caprifoliaceae	Angoore koli	Fruit	Fresh	9	60
Sambucus ebulus	Caprifoliaceae	Aghti	Bark	-	4	26.66
Euonymus latifolius (L.) Mill.	Celasteraceae	Gooshvarak	Fruit & leave	Decoction	3	20
Cichorium intybus L.	Asteraceae	Kasni	Root & leave	Decoction	4	26.66
Ecballium elaterium A. Rich	Cucurbitaceae	Khiareh vahshi	Root & fruit	Decoction	6	40
Euphorbia helioscopia L.	Euphorbiaceae	Ferfion	Root	Decoction	5	33.33
Ribes orientale Desf	Grossulariaceae	Angoore sharghi	Fruit	Decoction	8	53.33
Rumex acetosa	Polygonacea	Torshak	Leave	Fresh	2	13.33
Polypodium vulgare	Polypodiaceae	Befaiej	Rhizome	Decoction	7	46.66
Prunus spinosa L	Rosaceae	Gojeh vahshi	Fruit	Fresh & Decoction	4	26.66
Sorbus boissieri C. K. syn. S. aucuparia L	Rosaceae	Tis	Fruit	Decoction	1	6.66

N: The number of people who stated in this study that this plant has laxative effects; %: The percentage of people who stated in this study that this plant has laxative effects; -: Not announced.

Table 2. Distribution of medicinal plants as laxative in Arasbaran forests on this study

Row	Herbal family	Number
1	Berberidaceae	1
2	Equisetaceae	1
3	Caprifoliaceae	2
4	Celasteraceae	1
5	Asteraceae	1
6	Cucurbitaceae	1
7	Euphorbiaceae	1
8	Grossulariaceae	1
9	Polygonacea	1
10	Polypodiaceae	1
11	Rosaceae	2

Discussion

Numerous studies have documented the role of medicinal herbs as laxative to treat constipation (Akram et al., 2022). In Iranian traditional medicine, it is recommended to use herbs as laxatives to solve the problem of constipation (Karami et al., 2020). Therefore, the present ethnobotanical study that we know was the first to investigate the effect of medicinal plants of Arasbaran forests as a laxative on constipation. The results of the present ethnobotanical study revealed that thirteen medicinal herbs from eleven families including *Berberis vulgaris L.* known as barberry, *Equisetum arvense L.* (field horsetail), *Sambucus nigra L.* known as elder, *Sambucus ebulus*, *Euonymus latifolius (L.) Mill.*, *Cichorium intybus L.* known as chicory, *Ecballium elaterium A. Rich* (squirting cucumber), *Euphorbia helioscopia L.*, *Ribes orientale Desf, Rumex acetosa* known as Sorrel, *Polypodium vulgare* (common polypody), *Prunus spinosa L.* known as blackthorn and *Sorbus boissieri C. K. syn. S. aucuparia L.* were prescribed as laxative. In addition, the findings of the current study highlighted that medicinal plants in Berberidaceae, Equisetaceae, Caprifoliaceae, Celasteraceae, Asteraceae, Cucurbitaceae, Euphorbiaceae, Grossulariaceae, Polygonacea, Polypodiaceae, and Rosaceae families were recognized as potent laxative, respectively. Our work also demonstrated that fruit, leaves, aerial parts, bark, root, and rhizome were the most usable part of the mentioned plants. Furthermore, we found that these medicinal plants were administrated in the form of decoction and infusion. In recent decades, researchers have focused on the use of natural agents to treat various diseases. Herbal plants have a long history in the treatment of gastrointestinal diseases. In fact, medicinal plants with various phytochemicalcompounds, including flavonoids, phenolic compounds, terpenoids (or isoprenoids), saponins, and vitamins cause multiple therapeutic properties such as antioxidant, antimicrobial, anticancer and anti-inflammatory properties. Medicinal plants, with their anti-inflammatory and antimicrobial properties, deal with inflammation and pathogenic microbes in the digestive system, which are the cause of many diseases in these organs. On the other hand, the presence of high amounts of plant fibers in them increases the volume of feces, increases intestinal movements, and thus prevents constipation (Karami et al., 2020; Hashem et al., 2015). In a similar ethno-botanical study conducted by Karami N et al., the effectiveness of medicinal plants for treatment of constipation was evaluated in Shahrekord city, Chaharmahal & Bakhtiari province, Iran. The results of their study indicated that sixteen medicinal plants including flixweed (*Descurainia sophia* (L.) Prantle.),

fiddle dock (*Rumex pulcher* L.), *Alyssum spp*. Stead. Ex Boiss., almond (*Prunus amygdalus* L.), Persian manna (*Astragalus adscendens* Bioss. & Hausskn), *Echinops persicus* Stev. & Fisch., broadleaf plantain (*Plantago major* L.), *Rheum ribes* L., pink cotton lamb's ear (*Stachys lavandulifolia*), *Plantago major*, *Alcea spp.*, licorice (*Glycyrrhiza glabra* L.), wild rue (*Peganum harmala* L.), *Pistacia atlantica Desf.* and common basilisk (*Prangos ferulacea* L.) showed a potent anti-constipation effect (Karami et al., 2020). The results of this study in line with the results of our study documented the therapeutic effects of medicinal plants on constipation as laxative. In another similar study, Hashem Dabaghian F et al. reported that Iranian traditional medicinal plants such as golden shower tree (*Cassia fistula*), *Cotoneaster nummularia Fisch.*, tamarind (*Tamarindus indica*), camelthorn (*Alhagi camelorum*), and Damask rose (*Rosa damascene*) and almond oil were used to treat constipation especially during pregnancy (Hashem et al., 2015).

Conclusions

Our findings revealed that medicinal plants used in Arasbaran have potent therapeutic effect on constipation as laxative. The chemical compounds found in medicinal plants are the main factor in helping to treat constipation by increasing bowel movements and volume. Therefore, studying more about the role of herbal compounds in improving digestive problems such as constipation can be a factor in reducing the side effects of chemical drugs.

Declarations

Conflict of interest

There is no conflict of interest.

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None.

Consent for publications

The author approved the manuscript for publication.

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None.

Authors' contributions

SA and EB conceived the research idea. FB and SA designed the work. SA carried out the experiment. FB and EB wrote the first draft of the manuscript. SA carried out the literature search. EB carried out the statistical analysis, and SA supervised the study. All authors read and approved the final manuscript for publication.

Ethical considerations

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

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