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Journal of Chemical and Pharmaceutical Research, 2015, 7(2):483-492

Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

Ethnobotany study of effective medicinal plants on gastric problems in Lorestan province, West of Iran

Bahram Delfan[1], Mahmoud Bahmani[2], Hassan Hassanzadazar[3], Kourosh Saki[4], Mahmoud Rafieian-Kopaei[5*], Marzieh Rashidipour[6], Farid Bagheri[1] and Abdolsaheb Sharifi[7]

[1]Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran
[2]Food and Beverages Safety Research Center, Urmia University of Medical Sciences, Urmia, Iran
[3]Department of Food Safety and Hygiene, Health faculty, Zanjan University of medical science, Zanjan, Iran
[4]Shahid Beheshti University of Medical Sciences, Tehran, Iran
[5]Medical Plants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran
[6]Young Researchers and Elite Club, Khorramabad Branch, Islamic Azad University, Khorramabad, Iran
[7]Ilam University of Medical Sciences, Ilam, Iran

ABSTRACT

Digestive disorders are included high proportion and prevalent of human diseases. Most of these diseases occur as gastric and duodenal peptic ulcer, gastritis and dyspepsia. Treatment of disorders and diseases particularly gastritis and peptic ulcers have been done with medicinal plants in Lorestan province located in west of Iran. The aim of this study was to identify medicinal plants in this area which have been used to treat stomachache, gastritis and peptic ulcers. Obtained results from the questionnaire showed that 15 species of medicinal plants of eleven families are used for treatment of stomach disorders, including gastritis and peptic ulcers. Laminaceae family has the greatest therapeutic effect on gastritis and peptic ulcers. Leaves were the most used organs (31%) in 15 medicinal plants. Given to high incidence of digestive disorders in different societies and due to novelty of medicinal information of this study and their bioactive and antioxidants substances, medicinal plants can be used to produce natural products to treat gastric disorders.

Key words: Peptic ulcers, Medicinal plants, Lorestan province, Iran

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INTRODUCTION

Digestive disorders are included high proportion and prevalent of human diseases. Most of these diseases occur as gastric and duodenal peptic ulcer, gastritis and dyspepsia [1]. Gastritis includes a group of diseases that cause inflammatory changes in the gastric mucosa are classified into several categories including acute gastritis, chronic gastritis (with different forms: type A getting into the trunk with autoimmune cause, type B known as histologic form with antrum infection caused by Helicobacter pylori and environmental factors, type AB with unknown cause) and lymphocytic gastritis [2] [3].

Histologic gastritis is common and basically most people are infected with Helicobacter pylori but only a few of the patients show clinically significant outcomes such as peptic ulcer disease or gastric cancer [4].

Helicobacter pylori is colonized in the stomach of almost half of the total world population and is known as etiologic factor in chronic inflammation of the stomach, peptic ulcers and their complications. This bacteria cause 80% of stomach ulcers [5-7].

Peptic ulcer is one of the most important disorders of the gastrointestinal tract. Peptic ulcers occur due to an imbalance between aggressive factors including secretion of acid, pepsin, Helicobacter pylori, bile salts and increase in free radicals, against defense factors such as mucus, bicarbonate secretion, prostaglandins, antioxidant and blood flow [8][9].

Ulceration of the gastrointestinal tract, particularly peptic ulcers can be induced by increase of acid secretion due to different reasons: consumption of non-steroidal anti-inflammatory drugs and alcohol, long time starvation, bad eating habits and intensive continuous stress [1]. Gastric acid hyper secretion is one of the causes of peptic ulcers. Researchers have had great achievements on acid secretion inhibitors to reduce gastric acid secretion and retrofit gastric mucosal barrier, but the incidence still is high [10].

Non-steroidal anti-inflammatory drugs consumption such as aspirin is one of the causes of peptic ulcers [11].

Main location of Helicobacter pylori bacteria is gastric epithelial cells, which its colonization can occur in any part of stomach, but the most important is the epithelial cells of antrum. Helicobacter pylori infection causes chronic gastritis and peptic ulcers [12-14].

According to the World Health Institute, One-tenth of Americans will have peptic ulcers in their lifetime and 15000 deaths will occur due to the consequences of this disease, annually. Economic impact of this disease is very significant and is more than 10 billion dollars annually in the United States [15][16]. Non-steroidal anti-inflammatory drugs was the most common used drug in the world and many studies have shown relation between their consumption and peptic ulcers in western societies [17].

Treatment of peptic ulcers by conventional chemical drugs such as omeprazole, ranitidine and metronidazole is expensive and associated with side effects, the risk of recurrence after drug cessation and the risk of autoimmune diseases [18].

Medical researchers are trying to find out medicinal herbs and natural compounds for the treatment of diseases [19-25]. The use of medicinal herbs in prevention, control and treatment of various diseases has a long history [26]. The production of herbal medicines is faced with interest owing to their safety, experimental and scientifically proving, cheapness and easier processing [27][28]. Medicinal plants due to their chemicals bioactive antioxidant and therapeutic property can be a source of effective drugs [29-32].

Treatment of disorders and diseases particularly gastritis and peptic ulcer is done with herbal medicines in Lorestan province located in west of Iran. The aim of this study was to identify medicinal plants in this area which are used to treat stomachache, gastritis and peptic ulcers.

Figure 1. Lorestan province, West of Iran

EXPERIMENTAL SECTION

The study area

This study was done by using a provided questionnaire in Lorestan province that is located between 46 degrees and 51 minutes to 50 degrees 3 minutes east Longitudes of the Greenwich meridian and 32 degrees 37 minutes to 34 degrees 22 minutes north latitude from the equator. (Figure 1).

Lorestan province has four different climate include: Dry, Temperate Semi-humid, Cold semi-humid and Highland) with an area of about 28300 hectares. This region is mountainous, and the lowest point of 330 meters and its highest peak is 4050 meters above sea level. Climatic variation in the North East to South West is obvious.

Identification and collection methods of medicinal plants with therapeutic effect on peptic ulcers and gastritis.

To gather information on traditional medicine for peptic ulcers and stomachache healing, questionnaires were designed 11 trained volunteers performed collecting the information with cooperation of Food and Drug Deputy, Razi Herbal Medicines Research Center, Network Health of Khorramabad, Dorud, Poldokhtar, Boroujerd, Aleshtar, Aligudarz, Kouhdasht and Nurabad cities in the period 2007 to 2011. The questionnaire included information of the location, personal information's of the interviewer, local name of plants, native plants therapeutic effects, their used organs with their administration methods , season of plants growing and the type of plants have been kept at home. Trained liaisons attended in the villages. Questionnaires information was completed from 70 villagers informed about traditional medicinal plants. Mean age of participants was 85-50, including 21 female and 49 male subjects. Obtained results were analyzed using excel software 2010 [33-35].

RESULTS

Obtained results from the questionnaire showed that 15 species of medicinal plants of eleven families are used for treatment of stomach disorders, including gastritis and peptic ulcers. The scientific, family, local, Persian and English names, used parts of medicinal plants, using method, collection season and traditional therapeutical effects of medicinal plants are shown in Table 1.

Results of medicinal plants distribution of this study are shown in Figure 1. Laminaceae family has the greatest therapeutic effect on gastritis and peptic ulcers. Leaves were the most used organs in 15 medicinal plants (Figure 2). Decoction is the most using method in this study. Percent of other using methods in 15 medicinal plants is shown in figure 3. Medicinal plants were used in 73% cases for gastritis and stomachache and 27% for peptic ulcers treatment (Figure 4). 55% of medicinal plants are collected in spring season (Figure 5).

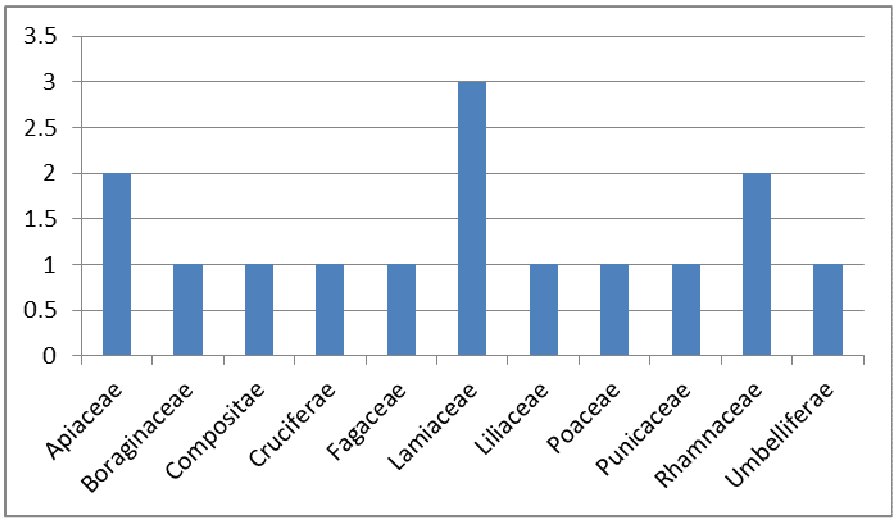

Figure 1. Distribution of medicinal plant families affecting peptic ulcer and gastritis

Table 1. Medicinal plants characteristics used for Stomach disorders in Lorestan province of Iran

No	Scientific name	Family	Local name	Farsi name	English name	Used organ	Using method	Collection season	Traditional therapeutical effect
1	*Allium haementhoides* Bioss. & Ruet. Ex Regel	Liliaceae	Sorpa	Piyaz Yazdi	Prairie onion	Leaf, Flower stem	Brew	Summer	Peptic ulcer
2	*Anchusa italica*	Boraginaceae	Gole-gazou	Gavzaban	Italian bugloss	Leaf, Flower	Decoction	Spring , Early Summer	Stomach ache
3	*Brassica napus*	Cruciferae	Kolza	Colza	Rapeseed	Leaf	Decoction	Spring	Stomach ache
4	*Foeniculum vulgaris*	Apiaceae	Raziane	Razianeh	Fennel	Seed	Decoction	Spring	Peptic ulcer
5	*Heracleum persicum*	Apiaceae	Kolpar	Golpar	Persian hogweed	Leaf, Flower	Decoction	Spring	Stomach ache
6	*Phleum pratense L.*	Poaceae	Kalake-gorbe	Dom gorbehee	Timothy	Branch	Brew	Spring	Stomach ache
7	*Punica granatum*	Punicaceae	Anar-doun	Anar	Pomegranate	Seed	Pomegranate fruits cooked under hot wood ashes and eat	Autumn	Peptic ulcer
8	*Quercus branti*	Fagaceae	Bali	Balout	Acron	Pith, Peel Leaf	Oak fruit crushed and mixed with yogurt and eat	Autumn	Stomach ache
9	*Satureja khozistanica*	Lamiaceae	Jataneh	Marzeh	Sweet fennel Savory	Branch	Dried leaves poured on food and consumed	Autumn	Stomach ache
10	*Teucrium polium*	Lamiaceae	Maryam-nokhodi	Maryam nokhodi	Water germander	Flower, Seed	Brew	Spring	Stomach ache
11	*Thymus daenensis, T. Kotschyanus T. Pubescens T. Falax T. eriocalyx*	Lamiaceae	Azboue	Avishan	Thyme	Flower, Leaf, Branch	Decoction	Spring, Early Summer	Stomach ache
12	*Tragapogon caricifolius*	Compositae	Sheng	Sheng	Salsify	Flower	Brew, Raw, Dried	Spring	Stomach ache
13	*Viola tricolor*	Umbelliferae	Gole-benoushe	Gol banafsheh	Wild pansy	Flower branch	Decoction	Spring	Stomach ache
14	*Ziziphus spina-christi*	Rhamnaceae	Konar	Sred	Lotus	Flower, Leaf	Decoction	Spring, Middle of summer, autumn	Stomach ache
15	*Ziziphus spina-christi Ziziphus nummularia*	Rhamnaceae	Melim	Shirinbayan	Licorice	Leaf, Root	Decoction	Spring, Summer	Peptic ulcer

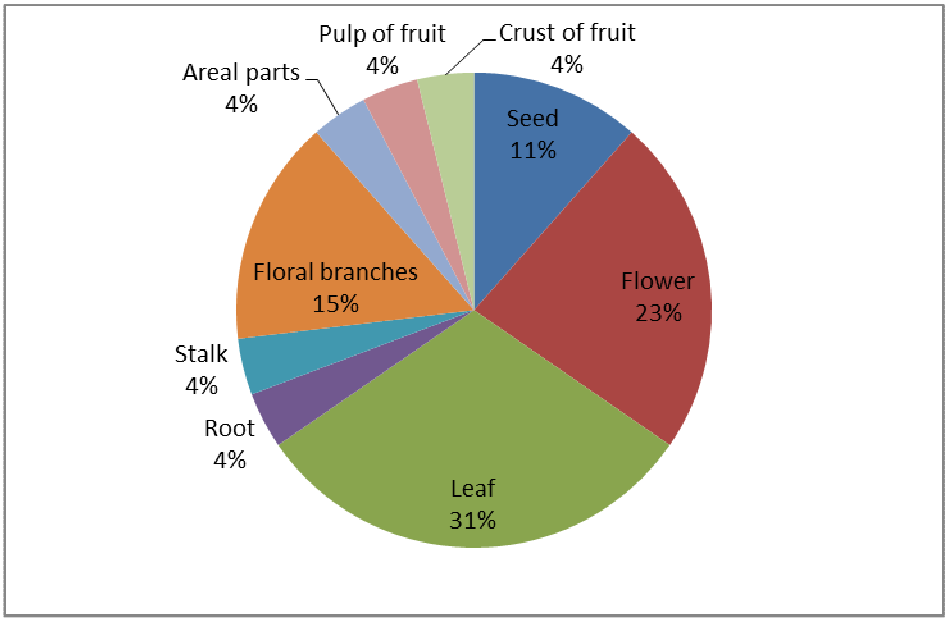

Figure 2. Percent of used organs in Lorestan province 15 medicinal plants

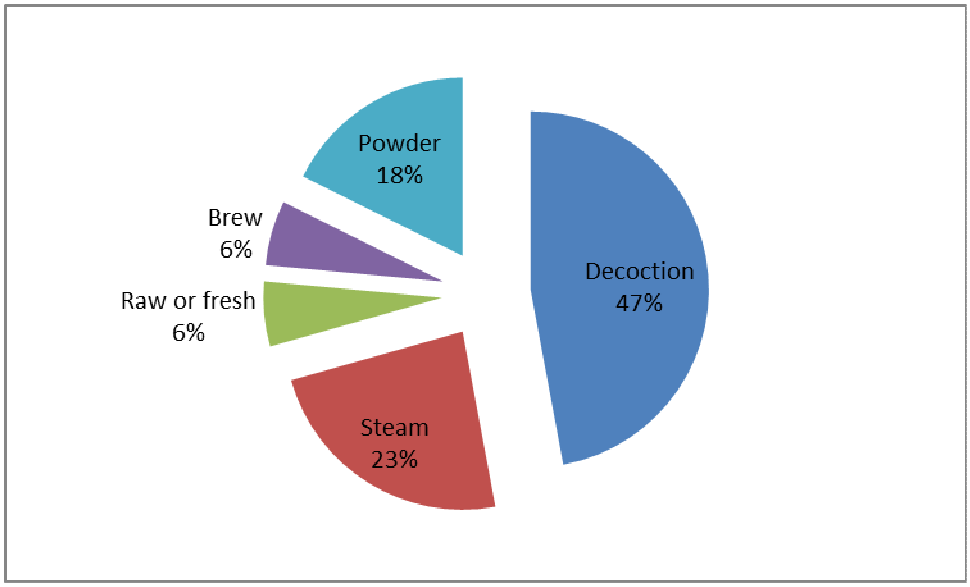

Figure 3. Common using methods in traditional medicine

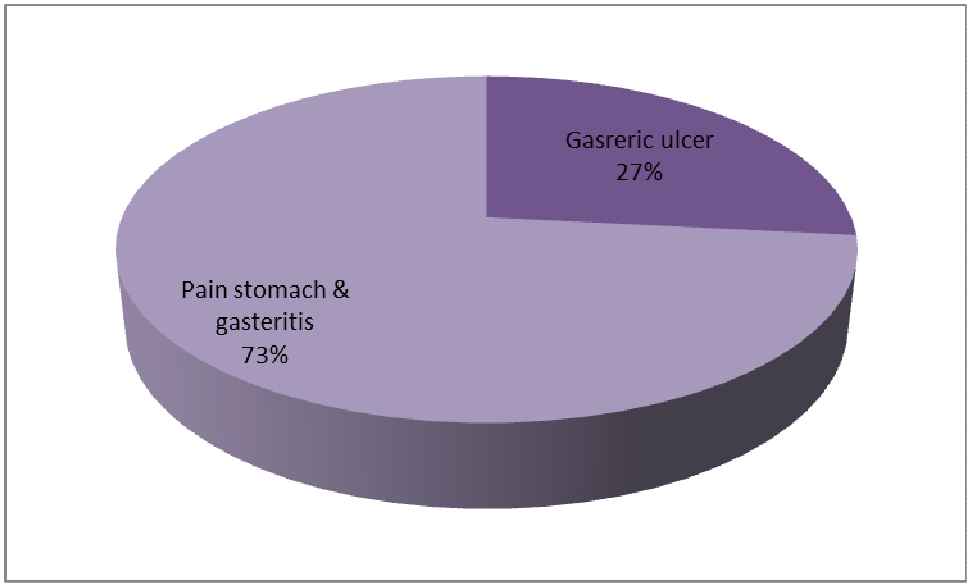

Figure 4. Medicinal plants using abundance based on therapeutic effect

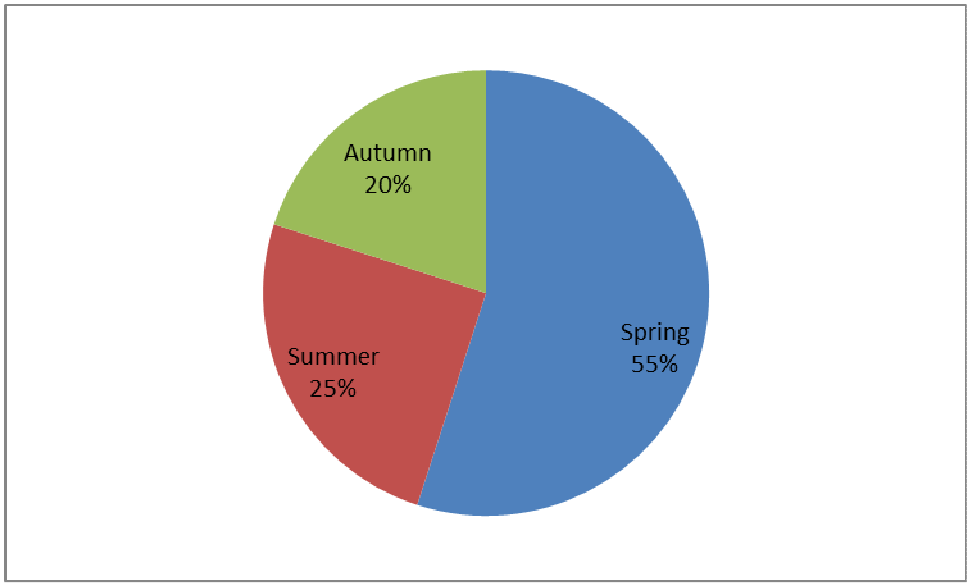

Figure 5. Collection season of medicinal plants used for stomach disorders

DISCUSSION

In this study, at first, ethnobotanics information of medicinal plants in Lorestan province was compared with other regions ethnobotanical data of Iran, and then medicinal plants characteristics with their active ingredients were studied. There are several reports about the plants which can possess different therapeutic properties and used for several disorders [36-43].

In Arasbaran (north of Iran), *Rhus coriaria* L. is used to relieve gastrointestinal bleeding. *Achillea millefolium* L. for gastric discomfort, Salvia sclarea L. for stomach ache, *Geum urbanum* L. for stomach disorders and *Urtica dioica* L. for relief of stomach [44].

Amaranthus retroflexus L. is used to treat peptic ulcers in Sistan Ethno-botany [45]. Ajuga or Sefid-Ajuga astro-iranica Rech F. is used to treat stomach disorders and *Linum album* Boiss is used to treat gastritis in Fars province ethno botany [46].

Thymus daenensis Celak is used to treat stomach disorders in Kashan at the center of Iran (47). *Mentha spicata* L., *Salix alba* L., *Astragalus verus* Oliv., *Mentha pulegium* L., *Punica granatum* L., *Sisymbrium irio* L., *Cichorium intybus* L., *Fumaria vaillantii* Loisel. , *Satureja hortensis* L., (*Cinnamomum verum* J.Presl, *Carum carvi* L. and

Elettaria cardamomum L . are used to treat stomachache and disorders in ethno botany of mobarakeh of Isfahan in the center of Iran (48). In the ethno botany of Kerman (East of Iran), *Achillea eriophora* is used to relief stomach disorders and gastritis, *Descurainia sophia* for stomach disorders, Ephedra distachya for peptic ulcers, Ephedra intermedia to treat peptic ulcers, *Mentha longifolia* to relief stomach discomfort, *Teucrium polium* and *Trachyspermum* for gastritis [49].

Achillea millefolium L., *Agrimonia eupatoria* L., *Daphne mucronata* Royle., *Glycyrrhiza glabra* L., *Grammosciadium daucoide* DC, *Plantago major* L., *Tanacetum parthenium* (L.) Sch. Bip. and *Ziziphora tenuior* L. are used to treat gastritis and peptic ulcers In Urmia, northwestern of Iran [50]. In Ilam province in West of Iran, *Allium ampeloprasum* L. subsp. *iranicum Wendelbo*, *Astaragalus glaucacanthus* Fisch., *Avena wiestii* Steud., *Centaurea iberica* Trev. Ex Spreng., *Centaurea intricate* Boiss., *Centaurea ovina* Pall. Ex Willd., *Cichorium intybus* L., *Elaeagnus angustifolia* L., *Glycyrrhiza glabra* L. var. glabra, *Picnomon acarna* (L.) Cass., *Quercus brantii* Lindl. Var persica (Jaub. & Spach) Zohary, *Satureja khuzistanica*, *Stipa capensis* Thunb. and *Ziziphus nummularia* (Burm. F.) Wight & Arn. are used to treat peptic ulcers and gastritis [51].

Comparing Lorestan ethno-botany with other parts ethno-botany showed that borage, oak, savory, Water germander, pomegranates, Salsify, cedar and licorice plants regarding to traditional therapeutic effects were common in different cultures, languages and areas of Iran.

Present study was introduced Wild pansy, canola, fennel, thyme and Prairie onion for the first time as a medicine to treat stomach disorders such as peptic ulcers, stomach-ache and gastritis.
Persian hogweed (*Heracleum persicum*) as a gastrotonic and anti-bloat herb increases gastric secretions and excretion of toxins in the body [52]. Studies has shown that trans-anethole is the most important bioactive substance in Persian hogweed [53].

Persian hogweed root contain abundant furanocoumarins effective in the treatment of sunburn. Due to its healing properties it can be used as an active ingredient to peptic ulcers healing [54].

Pomegranate fruit (*Punica granatum*) has pectin, ascorbic acid, flavonoids and polyphenols, Punicalagins (anticancer), Ellagitannins, anthocyanins which are an oxidative anti-stress (include cyanidin-3-glucoside, cyanidin 3,5 glucoside, Delphinidin 3-glucoside), catechin , gallic acid, Ellagic acid [55][56].

Oak fruits (*Quercus branti)* contain significant amounts of biologically active compounds including: tannin, gallic acid, Ellagic acid , Malic Acid, quercin, mucilage, pectin and Hexa hydroxi di phenol derivatives that all these compounds have antioxidant properties [57]. Phenolic compounds of oak and pomegranate fruits are bioactive and antioxidant compounds that have therapeutic effects.

Salsify (*Tragapogon caricifolius*) consumption cuts dysentery. Its extract is beneficial for healing peptic ulcers and ia gastrotonic. Salsify decoction is useful for liver abnormalities, Heartburn and Regurgitation. Razi recommended its consumption to exertion the toxins of body [58]. Salisfy has high content of inulin which is a soluble and fermentable fiber that improved defecation and helps to improve bowel function. In diet, Inulin induced growth of lactobacilli and bifidobacteria and inhibit pathogens growth [59].

Glycyrrhizin as a Saponin and triterpene compound is the basic ingredient in licorice (*Ziziphus spina-christ*). Licorice has anti-inflammatory and anti-fever effect. It seems that glycyrrhizi is effective in the treatment of gastritis [60].

Fennel (*Foeniculum vulgaris*) has anti-inflammatory, antispasmodic, carminative, diuretic, analgesic, wound healing and antioxidant effects which is effective in the treatment of gastrointestinal and neurological disorders [61]. Savory (*Satureja khozistanica*) due to its ingredients has antioxidant and anti-inflammatory properties [62]. Carvacrol and Parasymyn are the main constituents of Savory [63].

Thymol and carvacrol are the main constituents of the thyme species (*Thymus Spp.)* with antirheumatic, antispasmodic, antimicrobial properties and affecting on Sciatica [64]. Thyme, savory and fennel with its anti-inflammatory effect can reduce stomach ache and gastritis.

The mechanism actions of most of the mentioned drugs are unclear a need to be investigated. As in was said increase in free radicals is one of factors which increases the incidence of peptic ulcer [8][9]. Most of the above mentioned plants have antioxidant activity. It seems that a section of their effects is due to the plants antioxidant

activities. If it is the case, the other plants with antioxidant activity [65-75] and extra medicinal plant have helpful on diseases and disorders [76-92] and might be useful in gastrointestinal disorders.

Given to high incidence of digestive disorders in different societies and due to novelty of medicinal information of this study and their bioactive and antioxidants substances, medicinal plants can be used to produce natural products to treat gastric disorders .

Acknowledgment
The authors acknowledge the helps of Food and Drug deputy of LorestanUniversity of Medical Sciences in this study.

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