

# Medicine plants of folk medicine used for treatment of gastro-intestinal problems in Fergana valley

Valeriy V. Pak

식품기능연구본부

This article presents a review of indigenous medicinal plants used in folk medicine in Fergana valley (Uzbekistan) for treatment of gastro-intestinal problems. The 29 different plants belong to 18 different plant species are presented. The methods of preparation of remedies and utilized parts of plants are described.

## I. Introduction

Plant products - as part of foods or botanical portions and powder - have been used with varying success to cure and prevent diseases throughout history. Several diverse line of evidence indicates that medicinal plants represent the oldest and most widespread form of medication. Until recently, plants were an important source for the discovery of novel pharmacologically active compounds, with many blockbuster drugs being derived directly or indirectly from plants [1,2]. As it is estimated by World Health Organization (WHO) that 25 % of the active compounds in currently prescribed synthetic drugs were first identified in plant sources [3]. Thus, to collect information about medicine plant used in folk medicine is valuable source for discovery of new bioactive compounds.

The purpose of this article is to review the remedies of the folk medicine for treatment of gastro-intestinal problems used in Fergana valley presenting the most densely populated part of Uzbekistan.

## II. Geographic characteristic of Fergana valley

Fergana valley occupies a territory about 22,000 sq km and divided among Uzbekistan, Tajikistan and Kyrgyzstan (Fig. 1). The Fergana Range rises in the northeast and the Pamir in the south. The Gissar and Alay ranges stand across the Fergana valley, which lies south of the western Tian-Shan. The Xinjiang region of China borders the valley in the southeast. The Fergana Valley, consisting partly of the very

fertile Karakalpak steppe and partly of desert land, is drained by the Syr Darya river and numerous mountain streams, which are fed by snowfields and glaciers in the mountains. The valley owes its fertility to two rivers, the Naryn and the Kara Darya, which unite in the valley to form the Syr Darya.



Fig 1. The location of Fergana valley

The climate of this valley is continental, average temperature in July is 27.8 °C, in January is -2 to 9 °C. During the five months following April no rain falls, but it begins again in October. Snow and frost occur in December and January [4].

The large varieties in vegetation pattern are observed according to the altitude. The lowlands covered by desert sedge and grass. The trees and bushes are growth in the river valleys.

### III. Medicine plants of Fergana valley

The plant flora in Uzbekistan is accounted more than 4500 different plant species. Among these, 705 different plant species, which belong to 91 different families, present the medicine plants in Uzbekistan. Analysis of the medicine flora which is categorized into 20 major groups

based on the affected part or organ of the human body, reveals that wide use in medical purpose the next plants belong to following families: *Lamiaceae* - 19 group of diseases, *Apiaceae* - 18, *Asteraceae* - 17, *Rosaceae* - 17, *Fabaceae* - 17, *Caryophyllaceae* - 16, *Scrophylariaceae* - 16, *Ranunculaceae* - 15, *Brassicaceae* - 14, *Poaceae* - 14, *Polygonaceae* - 13, *Malvaceae* - 12, *Boraginaceae* - 12 and *Anacardiaceae* - 10 [5]. From above amount, a great number of indigenous plants are employed for the treatment of gastro-intestinal problems then follow dermatological problems and respiratory tract diseases.

This article presents the collected data of the indigenous medicinal plants that are employed in Fergana valley by healers and linked with gastro-intestinal problems.

Around 180 different plant species present a plant cover of this valley. The berry's trees and bushes such as *Rhamnus coriacea* L., *Crataegus pontica* C. Koch., *Amygdalus bucharica* Korsch., *Rosa fedtschenkoana* Regel, *Ephedra equisetina* Bunge, *Ephedra intermedia* Schrenk ex C.A. May., are prevailed in mountain part of a basin of Isphairam river. The *Hippophae rhamnoides* L., *Glycyrrhiza koshinsryi* Grig., *Plantago major* L., *Bidens tripartite* L. are growth in flood-land of rives and in mountain tugayes. The bushes of *Hypericum perforatum* L., *Codonopsis clematidea* Schrenk, *Inula helenium* L., *Achillea millefolium* L., *Tanacetum vulgare* L., *Artemisia dracunculus* L., *Tussilago farfara* L., *Echinops sphaerocephalus* L., *Cichorium intubus* L., *Taraxacum officinalis* Wigg., *Vince erecta* Regel et Schmalh., *Hyoscyamus niger* L., *Salvia scalarea* L., *Zizipfora pamiralaica* Juz. Ex Nevski, *Origanum thythanthum* Gontsch., *Lagochilus paulsenii* Brig are the most prevalent plant

covering a basin of Shakhimardan river. Some of the plant species such as *Aconitum serauschanicum* Steinb., *A. talassicum* M. Pop., *Allium sworovii* Regel, *Adonis chrysoyathus* Hookfil et Thoms., *Delphinium knorringanum* B. Fedtsch., *Physochlaina alaiica* ex Kovalevsk., *Salvia margaritae* Botsch., are the rare plant species growth in this area [6, 7]. The Table 1 presents the scientific names of plants with their family

names that are used as remedies for treatment of gastro-intestinal problems. Among them, some remedies were prescribed for treatment of several diseases that are also described in Table 1. The symptoms of the gastro-intestinal disorders were defined as stomachache, indigestion, diarrhea, gastric ulcer, colitis, abdominal pain, constipation and dysentery.

Analyses of the preparative form of remedies

Table 1. Remedy and preparation methods for treatment of diseases with gastro-intestinal problems

Scientific name	Family	Plant part used	Symptoms	Preparation and administration
<i>Bunium persicum</i>	Apiaceae	Seed	As digestive	Infusion as tea
<i>Carum carvi</i> L.	Apiaceae	Seed	Indigestion	Infusion as tea
<i>Ferula assa-foetida</i> L.	Apiaceae	Latex	Stomachache and piles	Root latex is collected in a small box. A small piece of that, as a wheat grain, swallowed once or twice a day before meals for 29 days
<i>Arum korolkawi</i> Regel	Araceae	Tuber	Stomachache	The pounded with milk or oil and ingested
			Cuts	Powdered and used externally
<i>Eminium regelii</i>	Araceae	Root	Stomachache, abdominal pain, internal diseases, dysentery	Powdered and used internally
<i>Artemisia absinthium</i>	Asteraceae	Flower	Stomachache	Infusion as tea
<i>Helichrysum maracandicum</i>	Asteraceae	Root	Stomachache	Powdered, ingested
		Flower	Liver diseases	Infusion as tea
<i>Inula grandis</i> Schrenk./ <i>Inula helenium</i> L./ <i>Inula Britannica</i> L.	Asteraceae	Root	Gastric ulcer	The roots are squeezed for obtaining sap. The one teaspoonful of that is drunk before meals for fortnight
<i>Berberis oblonga</i> Schneid.	Berberidaceae	Root	Jaundice, stomachache and dorsal pain	A black tough material called "Kiyamizirk" is prepared by evaporation of aqueous extract to dryness. "Kiyamizirk" is melted inside a glass of hot water prior to oral administration.
			Arthralgia	Small piece of "Kiyamizirk" is ingested 3 times a day

Scientific name	Family	Plant part used	Symptoms	Preparation and administration
<i>Citrullus lanatus</i>	<i>Cucurbitaceae</i>	Fruit	Jaundice, stomachache	Juice is recommended to drunk in large amount
<i>Cucurbita pepo</i> L.	<i>Cucurbitaceae</i>	Seed, fruit	Jaundice, stomachache	Used cooked fruit and seed as food
<i>Dipsacus dipsacoides</i>	<i>Dipsacaceae</i>	Root	<i>Inflammatory bowel</i>	<i>Boiled in milk and used internally</i>
		Latex	<i>As drastic</i>	<i>In summer a piece of bread is smeared with latex and kept at home for subsequent uses.</i>
<i>Hippophae rhamnoides</i> L.	<i>Elaeagnaceae</i>	Fruit	Gastric ulcer	<i>One part of fruit is put inside two parts of sunflower oil and left for extraction during a month. One teaspoonful of this extract is taken 3 times a day before meals</i>
<i>Euphorbia</i> (all species)	<i>Euphorbiaceae</i>	Latex, leaf	Constipation	<i>In summer latex or in winters infusion of two leaves are administered</i>
<i>Hypericum perforatum</i> L.	<i>Hypericaceae</i>	Herb	Stomachache, jaundice	<i>Decoction as tea</i>
		Flowered herb	Headache	<i>Decoction as tea</i>
<i>Hypericum scabrum</i> L.	<i>Hypericaceae</i>	Flowered herb	Stomachache, diarrhea	<i>Decoction as tea</i>
<i>Mentha longifolia</i> L.	<i>Juglandaceae</i>	Herb	Stomachache	<i>Mixture of herbs with those of Urtica dioica and Viola spp. are pounded together to obtain sap and drunk every morning 1-1.5 hour before breakfasts</i>
<i>Dracocephalum komarovii</i>	<i>Labiatae</i>	Leaf	Stomachache	<i>Decoction as tea</i>
<i>Oxytropis leucocyanea</i>	<i>Leguminosae</i>	Leaf	Gastric ulcer	<i>Decoction as tea</i>
<i>Aloe striatila</i>	<i>Liliaceae</i>	Leaf	Stomachache	<i>Leaves are squeezed to obtain sap and taken orally 3 times a day</i>
<i>Radiola heterotonta</i> Roth.	<i>Linaceae</i>	Root	Stomachache	<i>Decoction as tea</i>
			Gastric ulcer	<i>Left inside vodka for 15 days at room temperature. 25-30 drops of reddish extract is taken 3 times a day 15-20 min before meals</i>

Scientific name	Family	Plant part used	Symptoms	Preparation and administration	
<i>Plantago lanceolata</i> L.	<i>Plantaginaceae</i>	Leaf	<i>Stomachache in man</i>	<i>Decoction as tea</i>	
<i>Plantago major</i> L.	<i>Plantaginaceae</i>	Leaf, herb	Stomachache, peptic ulcer	Decoction as tea	
		Leaf	Stomachache	One fresh leaf is ingested before meals	
			Stomachache in woman	Decoction as tea	
			Stomachache	Cooked as meal and ingested	
				To provoke maturation of abscess or as styptic in cut	Fresh leaf is applied over abscess
				Rheumatic pain	The pain part is covered by fresh leaf
				Headache	Fresh leaf is applied on forehead
				Against gastric and intestinal cancer	Cut into small pieces and mixed with sugar, then kept in a warm place for 3 weeks. One tablespoonful of this extract is taken before meals
<i>Zea mays</i> L.	<i>Poaceae</i>	Seed	<i>Diarrhea</i>	<i>Decoction as tea</i>	
			<i>Jaundice</i>	Pounded with milk or yogurt and eaten	
			<i>To pass kidney stone</i>	<i>Decoction as tea</i>	
<i>Polygonum aviculare</i> L.	<i>Polygonaceae</i>	Herb	<i>Stomachache</i>	<i>Decoction as tea</i>	
<i>Polygonum hydropiper</i> L.	<i>Polygonaceae</i>	Flowering herb	<i>Hemorrhoid</i>	<i>Two tablespoonful of powdered material is added in 200 ml of hot water and left for 3-4 h. One tablespoonful of this extract is drunk before meals for 20-25 days</i>	

Scientific name	Family	Plant part used	Symptoms	Preparation and administration
<i>Rheum tataricum</i> L.	Polygonaceae	Leaf	Diarrhea	Fresh leaves are wilted in boiling water for a few seconds and then left to dry. Dried leaves are ingested to stop diarrhea
		Root	Abdominal pain	Powdered and used internally
			Hypertension	Decoction as tea
<i>Urtica dioica</i> L.	Urticaceae	Herb	Stomachache	Mixture of herb (with <i>Mentha longifolia</i> and <i>Viola</i> spp.) is pounded to obtain sap and administered every morning 1-1.5 hour before breakfasts
			As vulnerary	Sap obtained from fresh herb is applied over wounds
			To release kidney stone	Decoction as tea
			Uterine bleedings or wounds	Concoction with <i>Equisetum arvense</i> herbs, as tea
			Kidney stone	Pounded and applied on waist where kidney's line
			Rheumatic pain	Used externally
			Pruritic diseases	Decoction as tea or externally
			Rheumatic pain	Affected extremities are exposed to the vapors of boiling extract
<i>Viola collina</i> Bess.	Violaceae	Herb	Stomachache	Sap obtained by pounding the mixed herbs (with <i>Mentha longifolia</i> and <i>Urtica dioica</i> ) is administered every morning 1-1.5 hour before breakfasts

shows that decoction and infusions are definitely the most prevalent methods from dried materials and are prescribed as tea, whilst fresh leaves or herbs are generally pounded to obtain sap before the administration. The different extraction procedures may be applied for preparation of remedies. Vodka is used for extraction the less polar components (*Radiola heterotonta*) or boiling milk, which is used to prepare the remedy from *Cucurbita pepo* seeds against dysuria or from *Dipsacus dipsacoides* root against inflammatory bowel. More complicated techniques were used for the preparation of remedy, which is prescribed against of hypertension (*Korolkouwie sewersowii*) and against gastric intestinal cancers (*Plantago major* leaves).

Some of the remedies were presented as condensed extract, which is obtained by water evaporation, then wrapped in a small piece of vinyl sheet. A small piece of this tough material is cut by a knife and swallowed like a pill or placed in a glass of hot water to melt prior to oral administration (*Berberis oblonga* roots against arthralgia and dorsal pain).

Analysis of the indigenous medicinal plants reveals a number of medicinal plants also used in folk medicine in China, Russia, Korea, India and other countries. Although, it should be pointed that method preparation of remedy form from the same plants may be different to those in Uzbekistan.

Phytochemical and pharmacological analyses of some indigenous medicinal plants revealed biological active compounds of these plants such

as: aphrodisiac function of isolated two sexwiterpenes named as ferutinine and tenuferidine from *Ferula* plants; desoxypeganine hydrochloride which is presented chloride derivatives of the alkaloid desoxypeganine having an inhibitory activity against of cholineesterases, was found in *Peganum harmala* recently, the three new icetexane diterpenes, cyclocoulterson, komaroviquinone and a 20-norabietane diterpene, dracocephalone were isolated and identified from *D. komarovi* [8, 9].

#### IV. References

1. G.A. Gardell. Biodiversity and drug discovery. A symbiotic relationship. *Phytochemistry* 55 (2000), 463-480.
2. D.J. Newman. The influence of natural products upon drug discovery. *Nat. Prod. Res.* 17 (2000), 215-234.
3. F.M. Balandrin, J.A. Klocke, E.S. Wurtele, W.H. Bollinger. Natural plant chemicals: Sources of industrial and medicinal materials. *Science*. 228 (1985), 1154-1160.
4. D. Tekeli. Uzbekistan. Profile'99. European Economic Consultancy Center: Ankara, 1999, 143-179.
5. O.K. Khodzhimatov, T.G. Pak. The medicine flora potential of the South-West Tian-Shan. *Bulletin of "Tinbo"*, 1 (2005), 16-18.
6. Red Data Book of Republic Uzbekistan. Plants. Chinor ENK: Tashkent, 1998, V 2.
7. M.H. Akhmedova, A.M. Makhmedov. Medicine plants of Fergana. *Bulletin of "Tinbo"*, 1 (2005), 30-33.
8. N. Uchiyama, F. Kiuchi, M. Ito, G. Honda, Y.

Takeda, O.K. Khodzhimatov, O.A. Ashurmetov.  
New icetexane and 20-norabietane diterpene  
with trypanocidal activity from *Dracocephalum*  
*komarovi*. J. Nat. Prod. 66 (2003), 128-131.  
9. N. Uchiyama, M. Ito, F. Kiuchi, G. Honda, Y.

Takeda, O.K. Khodzhimatov, O.A. Ashurmetov.  
A trypanocidal diterpene with novel skeleton  
from *Dracocephalum komarovi*. Tetrahedron  
Lett. 45 (2004), 531-533.

