The biological effects of herbal medicine, *Falcaria vulgaris:* An article review

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Abstract

In traditional Chinese human medicine, herbs have been used as immunostimulants for thousands of years. Herbal medicines enhance the immunity level to resist more against the diseases. Among these herbs, *Falcaria vulgaris* a member of Apiaceae family, which is domestically known “Paghazou” and Ghaziaghi in farsi is traditionally has been used as dry powder in west and south-west of Iran, to accelerate skin wound healing for centuries.

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The major components of volatile oil Paghazeh were Spathulenol and carvacrol, which respectively belong to Sesquiterpene and Monoterpene and have antimicrobial activities. sickleweed (*F. vulgaris*) with 10% enriched diet feed has good effect to decrease the area of epidermis injuries experimentally formed in *Cyprinus carpio*. These herbs can be used as alternatives to common medicines, which have been confirmed to carry side effects.

Keywords: Herbal medicine, *Falcaria vulgaris*, Ulcer, Healing

Introduction

As medicinal plants are low-priced, can enhance the resistance Afsharnasab, Kakoolaki and Mohammadidost (2016), (Kakoolaki, Akbary, Zorriehzahra, Salehi, Sepahdari, Afsharnasab, Mehrabi & Jadgal 2016, Sadeghi, Akaberi, Emami, Sobhkhizi & Sahebkar 2017) and have

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fewer side effects in animals (Chelladurai, Veni, Mohanraj & Nagarajan 2017, Said, Kairy, Shalaby & Ismail 2017) compared with antibiotics, many scientists have recommended farmers to use them to prevent and control diseases (Kakoolaki et al. 2016). In traditional Chinese human medicine, herbs have been used as immunostimulants for thousands of years. Many herbal medicines have traditionally being used due to having antioxidant and bioactive compounds in Iran, of which *F. vulgaris* have known and unknown effects among the people of western part of Iran (Asadi-Samani, Bahmani & Rafieian-Kopaei 2014).

Falcaria vulgaris (Figs 1, 2) a member of Apiaceae family, which is domestically known "Paghazou" and Ghaziaghi in farsi (Jaberian, Piri & Nazari 2013, Delfan, Saki, Bahmani, Rangsaz, Delfan, Mohseni, Shirzad & Babaeian 2014, Choobkar 2016) is classified as umbelliferus plant is traditionally has been used as dry powder in west and south-west of Iran, to accelerate skin wound healing (Masoudi, Ameri, Rustaiyan, Moradalizadeh & Azar 2005, Shakibaie, Pasharavesh, Khoshboo & Kaboodi 2007) and to use as a vegetable in some areas . It is a 2-year and highly branched plant and have been used in the treatment of gastric and duodenal ulcers in west of Iran for last decades(Khanahmadi & Shahrezaei 2008). Figure 3 shows geographical distribution of *F. vulgaris* throughout the world.

Composition of volatile oil of *Falcaria vulgaris*

The results of the analysis showed that the major components of volatile oil Paghazeh were Spathulenol and carvacrol (Khanahmadi & Shahrezaei 2008), which partially was similar to the results of Jaberian et al. (2013) compared to the results of Shafaghat (2011) showed the maximum value were dedicated to Alpha – Pinene and Limonene, respectively as 33% and 14.4% (Table 1). Spathulenol and carvacrol are respectively belong to Sesquiterpene and Monoterpene and have antimicrobial activities (Khanahmadi & Shahrezaei 2008).

Fig 1 *Falcario vulgaris*, leaf (White arrow), stem (Red arrow) and size

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Fig 2 *Falcario vulgaris*, fresh leaves (left), dried leaves (right)

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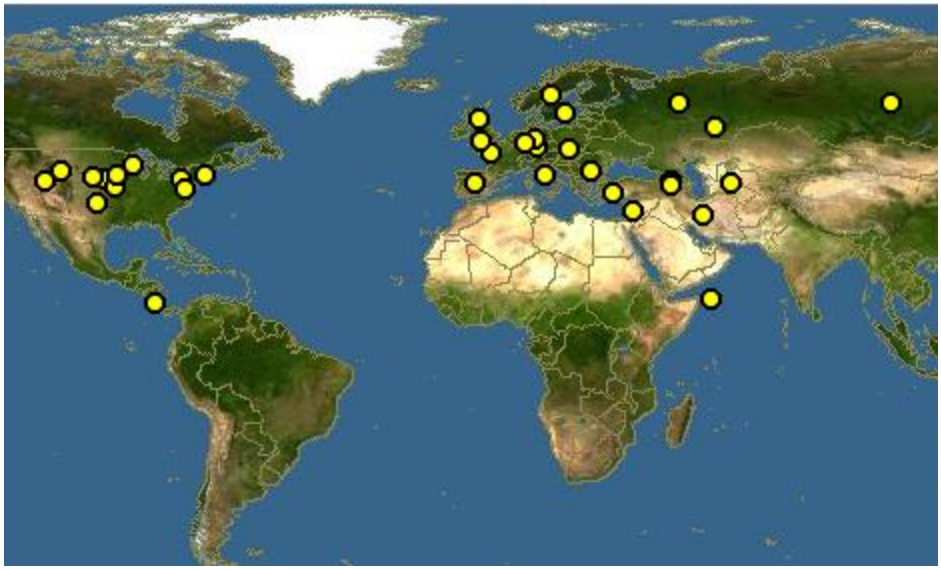

Fig 3 *Falcaria vulgaris* extended to west of Asia, Europe and America.

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Table 1 Chemical component extracts from the volatile oil existed in *Falcaria vulgaris*

composition	Value % (Khanahmadi & Shahrezaei 2008)	Value % (Shafaghat 2011)	Value % (Masoudi et al. 2005)	Value % (Jaberian et al. 2013)
Alpha – Pinene	1.87	33	0.7	1.8
Bata- Pinene	2.75	0.4	nd	2.5
Octanal	2.28	nd	nd	1.28
Limonene	1.57	14.4	nd	1.33
Carvacrol	20.93	-	nd	29.8
Bata- Ionone	0.75	-	nd	-
Bicyclogermacerne	0.70	2.8	1.5	0.07
Spathulenol	27.08	0.4	1.3	15.1
Germacrene-B	0.68	nd	67.9	1.24
1,5-Epoxysalvial-4(14)-ene	0.68	nd	nd	068
Caryophyllene oxide	2.69	nd	nd	0.7
Salvial – 4 (14)-en 1- one	1.59	nd	nd	1.9
Isospathulenol	1.22	nd	nd	1.4
Bisabolol oxide	1.48	nd	nd	-
Alpha – Bisabolol	3.75	nd	nd	0.29
Beta- oplopenone	1.12	nd	nd	0.15
Neophytadiene	0.52	nd	nd	0.12
Phytol	3.29	nd	nd	3.4

Constitutions less than 0,5% were not given in the table; nd: not defined

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Effect on skin wound and peptic Ulcer

Definitely, despite having many developments, industry made medicines have relatively unsuccessful to treat diseases, but some herbal medicines show adequate therapeutic effects, due to their antioxidant effectiveness (Bahmani & Asadi-Samani 2016). Using these plants to prevent, improve, and treat diseases dates back to humans' early life. Choobkar (2016) showed sickleweed (*F. vulgaris*) with 10% enriched diet feed has good effect to decrease the area of epidermis injuries experimentally formed in *Cyprinus carpio*. The area of the injuries was decreased from 0.03±0.005 to 0.006±0.001 after 21 days of study. Peptic ulcer treatment with omeprazole, metronidazole, and ranitidine is costly and may cause certain side effects and problems such as autoimmunity (Khazaei & Salehi 2006, Bahmani & Asadi-Samani 2016). Shakibaie et al. (2007) demonstrated that a diet enriched with *F. vulgaris* 5% was helpful for wound healing in rat. In addition to acceleration of wound healing, Paghazou 10% showed that it could be effective on skin tensile strength. In west of Iran, Some native herbal medicines have been applied to treat peptic ulcer, containing, Thymus *vulgaris, Glycyrrhiza glabra, Melisa officinalis, Quercus persica, Achillea mellifolium, Alhagi camelorum, Carum copticum, Anethum graveolens, F. vulgaris, Ziziphora clinopodioides, Medicago sativa,* and *Brassica oleracea*. These herbs can be used as alternatives to common medicines, which have been confirmed to carry side effects (Bahmani & Asadi-Samani 2016). In phytochemical studies, spathulenol and carvacrol, which are the great value in the plant, were defined as effective substances of *F. vulgaris* (Jivad & Bahmani 2016) in peptic ulcer.

Narcotizing solutions including ethanol can induce severe gastric hemorrhagic ulcers to rats. Ethanol induced both long and petechial ulcers in the experiments. Extract of *F. vulgaris* (Hydroalcolic) sheltered gastric ulcer encouraged by ethanol (50%) and healing ratios of the extracts 50, 100 and 150 ppm were 66.9, 76.09 and 80.25, respectively. It is definite that these concentrations produced a better healing than ranitidine tablet (50 ppm) against the peptic ulcer (Khazaei & Salehi 2006). Tahvilian, Shahriari, Faramarzi and Komasi (2014) also showed skin wound and peptic ulcer are treated by *F. vulgaris*. Among the possible mechanisms involved in wound healing can be caused by the plant stimulates the proliferation of fibroblasts in collagen synthesis (Shakibaie et al. 2007).

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Effect on Heart and haematological parameters

Choobkar (2016) in a study done on *Cyprinus carpio*, White blood cells were extremely increased from $0.15\pm22.93\times10^3$ in control group to $2.5\pm31.03\times10^3$, which imply on positive effect of Ghaziaghi on immunity level of carp. In addition, the values of lymphocyte, monocyte, eosinophil, basophil and red blood cells were significantly ($p< 0.05$) increased in fish fed 10% of *F. vulgaris* compared to control and the other group (2% of *F. vulgaris).* In another study (Shakibaie & Goodini 2010), nitric oxide in coronary vasodilatation extracted from Paghazeh extract in the isolated rat heart showed that infusion of 0.2, 1 and 5 ppm of the hydro-alcoholic extract of Paghazeh significantly increased the heart coronary flow after third to fifth minute of the experiment. Regarding the lack of LDH releasing from the heart it seems that this extract can be effective on the heart. Tahvilian et al. (2014) and (Delfan et al. 2014) also showed that *F. vulgaris* has significant effect on hemostasis. They quoted that whenever Iranian cooked Paghazeh leaves and eaten it with food, or drank a glass of its infusion once a day, the blood pressure significantly decreased.

Effect on bacterial growth

The results of disk diffusion method based on the diameter of growth inhibition showed that anti-bacterial effect of ethyl acetate fraction, which relatively extracts non-polar phenolic and flavonoids compounds, is greater than other extracts (Moshafi, Mehrabani, Mahdikhani & Saffari 2015). It shows the better effect on Gram positive-bacterial growth inhibition than Gram negative ones. Shafaghat (2011) showed there is a substantial effect of *F. vulgaris* leaf extract on bacterial inhibition whether positive or gram negative ones but concerning inhibition zone for bacteria such as *Enterococcus faecalis, Pseudomonas aeruginosa, Klebsiella pneumonia* were greater than *Escherichia coli*. This result indicated that flower and leaf extracts were more effective than stem extract. The later extract has no any effect on *E. coli* in vitro.

Other un-common usages

The results of the application of *F. Vulgaris* in the removal of heavy metals (Ramavandi, Kafaei, Ebrahimi, Mozhgan & Masoud 2014) showed that the sorbent made from this plant for the removal of copper ions from aqueous solutions showed appropriate capabilities. Considering its low cost and high efficiency of prepared absorbent produced from this herb can

be a suitable alternative to conventional chemicals to remove heavy metals from the polluted waters. Paghazeh could play as Febrifuge, carminative herb among the Iranian people (Tahvilian et al. 2014).

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اثرات بیولوژیکی گیاه طبی، غازیاقی (*Falcaria vulgaris*) بر خواص بیولوژیکی: مقاله مروری

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چکیده

در طب انسانی چین سنتی، گیاهان به عنوان محرک ایمنی برای هزاران سال استفاده شده است. دارو های گیاهی موجب افزایش سطح ایمنی و مقاومت بیشتر در برابر بیماری است. در میان این گیاهان، فالکاریا ولگاریس یا همان غازیاقی یک عضو از خانواده چتریان است که در داخل کشور "Paghazou" یا Ghaziaghi به زبان فارسی شناخته شده است به طور سنتی به عنوان پودر خشک، برای سرعت بخشیدن به بهبود زخمهای پوستی برای قرن ها استفاده می شود. اجزای اصلی روغن فرار Paghazeh اسپاتولنول و کارواکرول است که به ترتیب به سزکوئی ترپن و مونوترپن متعلق بوده و فعالیت های ضد میکروبی را بهره مندند. sickleweed. یا غازیاغی با غلظت ۱۰٪ در خوراک رژیم غذایی اثر خوبی برای کاهش منطقه ای از اپیدرم که آسیب تجربی در کپور کپور تشکیل شده داشته است. این گیاهان را می توان به عنوان جایگزینی برای داروهای رایج، که عوارض جانبی دارد استفاده شود.

کلمات کلیدی: گیاه دارویی، غازیاقی، زخم، بهبودی

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