An ethnopharmacological study of aromatic Uyghur medicinal plants in Xinjiang, China

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ABSTRACT

Context: An ethnobotanical survey was completed in a remote village and surrounding country of Xinjiang, where most Uyghur medicinal plants could be collected. This work clarifies and increases ethnobotanical data.

Objectives: We surveyed and organized aromatic medicinal plants that are commonly used in clinical settings to provide a significant reference for studying new medical activities.

Materials and methods: In the survey, informants who have traditional knowledge on aromatic Uyghur medicinal plants were interviewed between March 2014 and September 2014. Aromatic medicinal plant species and pertinent information were collected. Some therapeutic methods and modes of preparation of traditional aromatic medicinal plants were found.

Results: A total of 86 aromatic medicinal plant species belonging to 36 families were included in our study. We identified 34 plant species introduced from different regions such as Europe, India and Mediterranean areas. Fruits and whole plants were the most commonly used parts of plant, and most aromatic medicinal plants could be applied as medicine and food. We assigned the medicinal plants a use value (UV). Knowing the UV of species is useful in determining the use reliability and pharmacological features of related plants.

Conclusions: Xinjiang is an area in which indigenous aromatic medicinal plants are diversely used and has therefore established a sound dimensional medical healthcare treatment system. Some aromatic Uyghur medicinal plants are on the verge of extinction. Hence, further strategies for the conservation of these aromatic medicinal plants should be prioritized.

Introduction

China is a unified multi-ethnic country, where ethnic medicine is the official unified name for the traditional medicines of Chinese ethnic minorities because of the barriers produced by the different medical systems, language, culture and species characteristics. Research based on ethnic medicinal resources is rare (Li et al. 2006). In some ethnic minority areas, the production technology of traditional ethnic medicine and clinically common and key ethnic medicinal prescriptions is facing the risk of severe loss, without being passed on to the next generation (Vandebroek & Balick 2012).

Uyghur medicine is the scientific summary and the synthesis of the wisdom of the Uyghur people, who have been hard-working in the long-term practice of production to fight diseases. Therefore, Uyghur medicine has a complete theoretical system, involving rich practical experience and a unique method of diagnosis and treatment, representing a treasure among Chinese traditional medicine.

Uyghur medicine originated from Hetian, located in Xinjiang, and has a long history (Jiang & Nie 2015). There are more than 1000 Uyghur medicinal plants on record, among which, approximately 450 are most commonly used. Most Uyghur medicines are made from plants. The Uyghur people are skilled at using aromatic drugs, which commonly involve roses, lavender (Gonçalves & Romano 2013; Mendoza et al. 2014), lip vanilla, safflower, coriander, chicory, clove (Dalai et al. 2014), cardamom (Bajaj et al. 1993) and long pepper (Tian et al. 2012; Ding et al. 2014). An aromatic plant is a plant that contains a high content of aromatic substances (essential oils or resin) that can be used as a medicine or spice. These plants are both highly useful and of high value. The aromatic medicinal species included in this report were selected according to two books, on Chinese Aromatic Plants and Uyghur Medicine. There are many aromatic plants included in records on processing and utilization in the ancient literature of China. People have often used aromatic plants for flavouring, healthcare, in wine and cosmetics, as moth repellents and refreshing substances, and for cleaning air.

Uyghur medicine is the object of this article, therefore, herbal monographs from the literature, research data, standards and regulations and physical specimens were collected, mainly to obtain information about aromatic plant varieties (Shang et al. 2012). Information about the species used in Uyghur medicines and their distribution, clinical efficacy and applied resources (preparations) was collected and reorganized, supporting the analysis, application (Auerbach et al. 2012), sharing, use and protection of Uyghur herbal resources (Zheng et al. 2006; Fred-Jaiyesimi et al. 2015).
Materials and methods

Study area

Xinjiang Uyghur autonomous region lies in the northwest of China and is located in the centre of Eurasia. Its area is 166 km², which covers 1/6 of the total area of China. Xinjiang Uyghur autonomous region has a population of more than 16.9 million, of which more than 7.906 million are Uyghur nationality. An obvious feature of the terrain is the ‘three mountain clip two basins’ (Liu et al. 2014) (Figure 1). Xinjiang is characterized by its dry climate, with the main features of sufficient sunshine and deficient rainfall. The area is far from the ocean and is surrounded by mountains, which is not only reflected in reduced moisture in the area, but also in the difference in the rainfall distribution. The Tianshan Mountains prevent cold air from flowing to the south, thus, constituting the climate demarcation line that separates the temperate zone in the north from the warm temperate zone in the south. The annual average temperature in southern Xinjiang ranges from 10 to 13°C, whereas it is below 10°C in the north. The average rainfall is only 45 mm, and rainfall in the north is much greater than in the south (YIN et al. 2011). Another characteristic of the area is the great discrepancy of temperature between day and night; generally, the temperature increases rapidly during the day, whereas it drops at night. People in northern Xinjiang are vulnerable to rheumatism because of the cold weather, whereas people in the south commonly suffer from liver disease, gastrointestinal disease, cardiovascular disease (Cámara-Leret et al. 2014), vitiligo and psoriasis, which can be attributed to their eating habits (giving priority to meat) and its dryness and temperature range.

Field interview methods

We carried out semi-structured ethnobotanical interviews with individual natives residing in the study area in the Uyghur region between March 2014 and September 2014. A total of 200 individuals (101 men, 99 women) were interviewed in five districts, including Altay, Changji, Yili, Bazhou and Hetian. In each district, we interviewed four counties. Bazhou, Hetian are relatively large area in the south of Xinjiang. The areas are multi-ethnic areas; therefore the research on the ethnic medicine has certain representative, Altay and Yili, in the north and northwest of Xinjiang, respectively. The main nationality are Uyghur and Kazak, they have a certain understanding of the research of the ethnic medicine. Changji in the east of Xinjiang, it can be representative of the people in the east of Xinjiang on the ethnic medicine research. These five areas in Xinjiang are very representative of the region.

Figure 1. Map of the study area, Xinjiang, China.
Interviews were conducted in bazaars, houses and parks. We confirm that the field studies did not involve endangered or protected species. Additionally, no specific permissions were required for these locations because all of the locations were public, not private. After explaining the objective of our study, we asked detailed questions related to the medicinal uses of plants (Wang et al. 2013). People who demonstrated knowledge of plants were interviewed at least twice (Polat et al. 2013). The obtained information was compared with other areas and local counties to verify its accuracy. The interviewees ranged in age from 35 to 95 years, most of whom were elders. We transcribed all interviews and deposited the recordings with the Medicinal Resources Census Project Team of China (Chen et al. 2014).

The participants provided their verbal informed consent to participate in this study. During the survey, after explaining the objective of our study, the interviewees provided us with detailed answers to questions related to the medicinal uses of plants. We subsequently transcribed all the interviews and deposited the recordings in our storehouse. All the information on aromatic Uyghur medicinal plants was recorded in tables produced by the Resource Census Project Team of China. Written consent was collected and analyzed by the authors, and the authors used another method to express the main meaning of the participants’ consent. Therefore, all of the written consents are listed in Table 1. Of course, the Medical Ethics Committees of Xinjiang Medical University approved this consent procedure.

The interview questions were aimed at understanding the traditional uses of medicinal plants, including local plant names, ailments for which the plants were used, the parts of the plants used, and methods of preparation and administration. We accompanied the interviewees into the field to collect specimens of the plants to which they were referred. We also deposited the plant materials collected in our study with the Medicinal Resources Census Project Team of China (Figure 2).

Voucher specimen collection

To exemplify and protect the aromatic medicinal plants obtained in Xinjiang to the best extent possible, we collected voucher specimens between March and September 2014. Voucher specimens were collected and prepared under the directions of herbalists and local people, who have much experience with these aromatic Uyghur medicinal plants. The plants were identified by a research team specialized in Uyghur medicinal resources, consist of several pharmaceutical professors and several graduate students from Xinjiang Medicine University, and specimens were deposited in the Traditional Chinese Medicine Voucher Herbarium of Xinjiang Medicine University. All data were collected in a database.

Data analysis

The use value (UV), a quantitative index that indicates the relative importance of locally known species, was also calculated according to the following formula: 

\[ \text{UV} = \frac{U}{N} \]

where \( U \) is the number of reported uses cited by each informant for a given species, and \( N \) refers to the total number of reports in which UV refers to the UV of a species. UVs are high when there are many reported uses for a plant, thereby indicating that the plants are actively used by local people, whereas when there are few reports related to a plant’s use, the UV approaches zero (Boakye et al. 2015). Therefore, knowing the UV of a species may be useful in determining the reliability of the use and pharmacological features of related plants.

Results and discussion

Families and medicinal plants

A total of 86 aromatic medicinal species belonging to 36 families were included in the present study (Table 1). About 12 medicinal species belonged to Lamiaceae, which was the family with the highest percentage (13.95%) of medicinal species used by the Uyghur people, followed by Apiaceae and Rosaceae (11.63%) with 10 species, and Compositae (9.30%) with 8 species. These four families account for 46.51% of the total number of aromatic medicinal species identified. The remaining 46 species belongs to 8 other families with less than six species each, while only one species was obtained for approximately 20 families (Table 2).

In the analysis conducted in this study, many species collected in Xinjiang were observed to be used medicinally and were easily accessed (Liu & Shawuti 1985; Liu 1999).

Plant parts and mode of preparation

Fruits (22 species) were the most commonly used parts of the plants, followed by the whole plant (17 species), seeds (15 species) and flowers (7 species), respectively (Figure 3). Additionally, for 13 species, two or more parts are used in the treatment and curing of diseases, with different parts employed for different effects. For example, the root of Ephedra presents a hidrosis function to treat the night sweats caused by pulmonary tuberculosis and weakness of the body, while the herbaceous stem, which is also used for sweating, is applied to cure colds, coughs, bronchial asthma and malaria. Based on the above findings, we can safely draw the conclusion that different parts of the plants exhibit different functions. We must clarify the function of every part before it can be used to cure diseases (Song et al. 2005).

The results of our survey demonstrated that decoction was the most common mode of preparing aromatic medicinal plants, accounting for 61.72% of the recorded preparations, followed by syrups (47.66%), powders (45.31%), honey pastes (35.16%), poultices (28.13%) and pills (16.41%) (Figure 4). Therefore, there are several methods for the preparation of aromatic medicinal plants (Liu et al. 1993). However, different methods present different efficiencies, and the most appropriate preparation method should be chosen.

Disorders treated

Based on this survey, the collected aromatic plants are widely used in local traditional Chinese medicine, specifically in Uyghur medicine, to treat gastropathy, liver complaints, parasites and dysentery. Commonly, doctors combine two or more aromatic medicinal plants to treat a particular ailment. In this survey, most of the identified aromatic medicinal plants can be employed as both medicine and food. The local population uses these plants daily to maintain good health in the long-term (Halmurat et al. 2011, King et al. 2015). Some aromatic medicinal plants can be made into healthcare products, such as herbal teas, medicinal liquors and essential oils, which contribute to health in therapies or prevention. In addition, a few of the aromatic plants can be developed into insecticides against parasites. Furthermore, some farmers cultivate aromatic vegetables with certain
### Table 1. Plant species used for medicinal purposes in Xinjiang, China.

| Family      | Latin names | Local names | Parts used | Main chemical composition of volatile oil | Administration form | Traditional therapeutic indications | The adverse reactions and remedy | Way of administration | Use report | UV     |
|-------------|-------------|-------------|------------|------------------------------------------|---------------------|------------------------------------|---------------------------------|------------------------|------------|--------|
| Acoraceae   | Acorus calamus L. | Yi ge er | Rhizome | cis-Methylisoegenol, acoragermacrone, isocalamendiol, calamene | Pi, HP, Po | Sedation, anti-hypertension, anti-asthmatic, anti-tussive, spasmodylysis, anti-bacterial | Harmful to brain, Remedy: fennel | OR, EX | 3 | 0.03 |
| Amaryllidaceae | Allium cepa L. | Pi ya zi | The whole plant | Thiol, methyldisulphide, allyl disulphide, trisulphide | Po, HP, Pou | Atherosclerosis, esomeritis, diabetic, anti-diabetic, vitamin C supplement | Harmful to brain, reduce the ability of memory, Remedy: grape vinegar, honey, salt, pomegranate juice | OR, EX | 1 | 0.01 |
| Apiaceae    | Anethum graveolens L. | Se ni ke qie ke ou ru he | Seed | Carvone, limonene, dillapiole | D,MO | Diuretic, anti-asthmatic, anti-tussive, anti-bacterial | It can reduce the ability of brain and visual acuity, Remedy: sour food | OR, EX | 1 | 0.01 |
| Apiaceae    | Coriandrum sativum L. | You mi ha le su ti | The whole plant, fruit | Caparinaldehyde, non-anlan, linalool, geraniol | D, S, Pou | Clearing heat for demescence, anti-pyretic, diuretic | Harmful to intestinal disease and cystitis patients, Remedy: semen melo, acacia | OR, EX | 0 | 0.00 |
| Apiaceae    | Cuminum cyminum L. | Zi re | Fruit, seed | Cuminaldehyde, cuminal, α,β-phellandrene | Po, Pou, HP | Carminative, stimulate nerves, anti-bacterial, promoting digestion | Harmful to lungs, Remedy: tragacanth gum | OR, EX | 1 | 0.01 |
| Apiaceae    | Daucus carota L. | Sai wei zi ou ru he | Seed, fruit | 1-limonene, cineole, geraniol, citronelol, cital, Caryophyllen | Po, D,S | Inducing diuresis for treating stranguria, dispelling cold, regulating menstrual cycle | / | OR | 1 | 0.01 |
| Apiaceae    | Fừaula assafoetida L. | Ying ou ru he | Seed | (β)-2-Buty-1-propanyl, disulphide, α-pinene, phellandrine | Po, HP, Pou | Dispel the wind, relieve pain, enhance memory, diminish inflammation, apocatastasis | Harmful to intestinal disease and cystitis patients, Remedy: semen melo, acacia | OR, EX | 0 | 0.00 |
| Apiaceae    | Ferula sinkangensis K. M. Shen. | Ying | Resin | α-Pinene, phellandrene, α-terpinen, bornyl acetate | Pi, Po, HP | Anthralgia, paralysis, traumatic injury | Forbidden for pregnant women, harmful to brain and liver, Remedy: acacia, anise, pomegranate fruit | OR, EX | 0 | 0.00 |
| Apiaceae    | Furaiculeum vulgare Mill. A pa ba di yang | Fruit, root bark | trans-Anethole, fenchone, limonene, β-pinene, methyl cychavol | HP,S,D | Anti-tumour, cholagogue, inhibition of gastric ulcer, anti-bacterial | Harmful to febrile healthy, Remedy: sandalwood | OR, EX | 10 | 0.11 |
| Apiaceae    | Pimpinella anisum L. | Ru mi bie di yang | Seed | Anisaldehyde, amnic acid, anethole, anisyloectone | HP, S, Pi | Facial paralysis, headache, amenorrhea, exhausting qi, pro laction | Harmful to intestinal disease, Remedy: fennel | OR, EX | 1 | 0.01 |
| Apiaceae    | Pleuroserpum Indieyanum (Lipsky) B. Fedtsch. | Yu re ke ou ti | The whole plant | α-Pinene, myristicin, elemicin, asarone, ocimene | A,M,F,S | Coronary, heart disease, anaesthesia, anti-asthmatic, anti- | / | OR | 0 | 0.00 |

(continued)
| Family       | Latin names                        | Local names          | Parts used     | Main chemical composition of volatile oil                                                                 | Administration form | Traditional therapeutic indications                  | The adverse reactions and remedy                      | Way of administration | Use report | UV  |
|-------------|-----------------------------------|----------------------|----------------|-----------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------|------------------------------------------------------|------------------------|------------|------|
| Apiaceae    | Ferula fukanensis K. M. Shen.      | Ying yi li mi       | Resin          | Phellandrine, (R)-2-Buty-1-propanyl, disulphide, γ-pinene, phellandrine, undecyl-sulfinyl acetic acid     | Po, HP, Po          | Tussive, anti-hypertension                          | Forbidden for pregnant women, harmful to brain and liver | OR, EX                 | 1          | 0.01 |
| Apiaceae    | Nerium indicum Mill.              | Su gai ti gu li     | Leaves, bark, root | Menthol, salicylate, acetic acid, butanone alcohol, ethyl sulphide, ethyl acetate                        | MO, Pou, O          | Cardiotonic action, diuretic, sedation              | Rank poison, harmful to brain and lungs, can make people dazzled | EX                     | 0          | 0.00 |
| Arecaceae   | Areca catechu L.                  | Fu pai li            | Seed           | /                                                          | Po, D, HP           | Insect repellent, against pathogen, increase appetite, anti-cancer, anti-hypertensive, antioxidant | Lead to chest and lung dryness, kidney stone and vesical calculus | OR, EX                 | 0          | 0.00 |
| Arecaceae   | Cocos nucifera L.                 | Na er ji li          | Fruit          | 2-Heptanone, 2-manonnone, dodecyl acid, n-amyl butyrate, γ-decanolactone                               | HP, Po              | Tonifying brain, psychosis, hypochondria, tocolsysis | It cannot be digested easily                           | OR, EX                 | 2          | 0.02 |
| Araliaceae  | Panax ginseng C.A.Mey.            | A dai mu ge ya       | Root           | Panaxyol, elemene β-aromadendrene, tetradecanoic acid, cetylic acid                                  | D, HP               | Neurasthenia, amnesia, vasodilation, anti-shock, anti-hypertension, promoting metabolism | It cannot be eaten with helleborus thibetanus           | OR                     | 0          | 0.00 |
| Araliaceae  | Panax notoginseng (Burk) F. H. Chen| San qi               | Root           | Spathulenol, heptane, γ-sitosterol, panaxyol, ethyl linolenate                                         | D, Po, Pi           | Dilate the coronary arteriae, increased coronary flow, resisting acute myocardial, ischaemic injury, anti-hypertension, haematolysis | /                                                   | OR, EX                 | 0          | 0.00 |
| Aristolochiaceae | Asarum europaeum L.               | A sa rong            | The whole plant | Asarone, d-asarone asarylaldehyde, 1-pinene, eugenol, methyleugenol, bomylacetate                      | HP, D, Po           | Local anaesthesia, antipyretic analgesic, anti-bacterial, anti-hypertension | Harmful to liver, Remedy: raisin grape or sophora flower | OR, EX                 | 1          | 0.01 |
| Brassicaceae | Brassica juncea (L.) Czernet Goss | Ke zi li ke zha      | Seed           | Dolomene, methyl-iso-rohdanate, butyl isothiocyante, propyl isorhodanate, benzene methyl, isocyante     | Pou                 | Anti-bacterial, increase appetite, improve blood circulation, expectorant emetic | /                                                   | OR, EX                 | 0          | 0.00 |
| Brassicaceae | Sinapis alba L.                   | A ke le zha          | Seed           | /                                                          | Pou                 |                                          | Excessive oral can cause headache, Remedy: granulated sugar  | OR, EX                 | 2          | 0.02 |
| Burseraceae | Boswellia carterii Birdw          | Kun du er             | Resin          | Pinene, dipentene, α,β-phellandrene                        | HP, Po, Pou         | Anti-Inflammatory, enhance memory, bronchictasia, aco-sodyne, caoachylia              | Excessive oral can cause headache                      | OR, EX                 | 0          | 0.00 |
| Compositae  | Artemisia absinthium L.           | A qi ke ai man        | Leaves         | Thujone, thujol                                           | S, D, T             | Laryngopharyngitis, amygdalitis typhoid, fever, hepatitis                            | Excessive oral can cause headache, Remedy: anisum   | OR, EX                 | 3          | 0.03 |

(continued)
| Family               | Latin names                        | Local names            | Parts used | Main chemical composition of volatile oil                                                                 | Administration form | Traditional therapeutic indications                                                                 | The adverse reactions and remedy                                                                 | Way of administration | Use report | UV  |
|---------------------|------------------------------------|------------------------|------------|----------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------|------------|------|
| Compositae          | Artemisia argyi L. et Vant          | Ai man                 | Leaves     | Phellandrene, cadinene, thujyl alcohol                                                                  | D, S, Pou           | Anti-bacterial, antihistalgia, oedema, dys-tasia, olibacrinosis                                   | Excessive oral can cause headache, harmful to kidney, Remedy: anisum, mastiché                                  | OR, EX                | 0          | 0.00 |
| Compositae          | Artemisia rupestris L.             | Yi zi qiu ai mi ni    | The whole plant | Linalool, p-cymene, α-terpineol, β-pine terpinen-4-ol, α-pinene                                        | D, S, Pi            | Anti-anaphylaxes, cold, fever, headache, stomach ache, hepato-tis                                 | /                                                                  | OR, EX                | 0          | 0.00 |
| Compositae          | Aucklandia lappa Dence.            | Ku si tai              | Root        | β-Elemene, globulol, α-muurolene, dehydrcocurs lactone, costunolide                                    | HP, S, Po           | Appetizing, acesodyne, insect repellent, aphoediosis, hepatalgia pneumalgia, anti- allergic      | Harmful to bladder and lungs, Remedy: anisum, flos roseae rugosae, maccsecute                               | OR, EX                | 4          | 0.05 |
| Compositae          | Carthamus tinctorius L.            | zha sang za qie qie    | Flower      | Decahydrate, 3,3-dimethy-3-hept-ane, 2,2,4-trimethyl-3-amyliketone, octane                           | D, HP, S            | Irregular menstrual, impotence, asthma, leucodema, eczema                                         | Excessive oral can cause headache, harmful to gastroitis and throat disease, Remedy: anisum and honey          | OR, EX                | 0          | 0.00 |
| Compositae          | Cichorium intybus L.               | Ka si ni               | The whole plant | Gichorin, dixacytly, furaldehyde, furan lactate, maltol                                                 | S, D                | Hepatitis, gastritis, jaundice, spleanaux, oedema                                                | Excessive oral can cause cough, Remedy: white sugar or viola bahanicans maxima                               | OR, EX                | 7          | 0.08 |
| Compositae          | Dendranthema morifolium (Ramat.) Tzvel. | Ju hua gu li        | Capitulum   | α-verbenal, bomyl acetate, cinenile, (+)-zingibrenene, cuhenol, α-firnene                               | D, S                | Disintoxication, anti-pruritic liver heat, ophthalmodynia, detumesence, anti-bacterial            | Harmful to cold property of body, Remedy: fennel                                                         | OR                    | 0          | 0.00 |
| Cucurbitaceae       | Cucumis melo L.                    | Kuo hun                | Fruit, seed, pedicel | Ethyl acetate, 2-methylbutanol, 2-phenethyl alcohol, 2-methyl-1-propanol, 1-heptanol                 | D, S                | Dry stool, dysuria, emaciation, stomach discomfort, quench one's thirst                            | Excessive oral can cause diarhoea, fever and various of eye diseases, Remedy: pomegranate juice, honey, mastic, rhizoma zingiberis | OR                    | 0          | 0.00 |
| Cucurbitaceae       | Cucurbita moschata L.              | Kuo ke ka wu ru he    | Seed        | Linoleic acid, oleic acid, palmitic acid, stearic acid, linolenic acid, myric acid                      | Po, cataplasm       | Fever, oedema, acute pneumonia, insect repellent, anti-schistosoma                             | Harmful to cold property of body, Remedy: fennel, black pepper                                           | OR                    | 0          | 0.00 |
| Cupressaceae        | Sabina vulgaris Antoine            | A i cha meiwei si     | Cone        | Sugiol, deoxyropyphiyl-lotaiin, sabina coumarin, β-sitosterol, myristic acid lactone                  | D, S, T, Po         | Amanoitohea, stomach cold, abscess, black shading, gingival erosion                                | Harmful to lungs Remedy: tragacanth gum, cannot be used by pregnant woman, gastross and throat disease, Remedy: galangal, honey, Young girl and unmarried young woman had not to smell | OR, EX                | 0          | 0.00 |
| Elaeagnaceae        | Elaeagnus angustifolia L.          | Ji ge de qie qi ke    | Flower      | Phenethyl alcohol, methyl cinnamate, palmitic acid, ethyl palmitate, ethyl deate, nonadecanoc acid   | S, Pou              | Inhibited sexual desire, asthma, pectoralgia, prevent disease                                  | /                                                                  | OR, EX                | 0          | 0.00 |

(continued)
| Family              | Latin names         | Local names       | Parts used          | Main chemical composition of volatile oil                                      | Administration form | Traditional therapeutic indications                                                                 | The adverse reactions and remedy                  | Way of administration | Use report | UV |
|---------------------|---------------------|-------------------|---------------------|--------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------|----------------------|------------|----|
| Elaeagnaceae        | Elaeagnus rhamnoides subsp. sinensis Rouxi | Ji hang           | Fruit               | n-Tetradecanal, n-pentadecanal, 1,3-dihyroxynon-9-ene, α,β-limonene, 1,6-dihydroxy-7-nonenol | S, D                | Anti-tussive, anti-emetic, relieving asthma, anti-hypertension, calcidiol, increase vitamin  | Deleteriousness Remedy/                           | OR, EX               | 0           | 0.00 |
| Ephedraceae         | Ephedra equisetina Bunge | Zha kang da       | Herbaceous stem, root | 4-Terpineol, butylated hydroxytoluene, patchouline, octyl pyridazine ring, (4R)-naphthalene | D, S, Po            | Cough, relieving asthma, cold, pneumonia, night sweat, diarrhoea, skin and external diseases   | Deleteriousness, excessive oral can                | OR, EX               | 0           | 0.00 |
| Euphorbiaceae       | Rauvolfia communis L. | Yi nai le pi ti ou ru he | Seed               | Rcinolic acid, glyceride, isopropyl nicotinic acid, palmitic acid, octadeacenoic acid | Pi, HP, Pou          | Facial paralysys, arthritis, cough, headache, celldomyia, astecion, cerebral haemorrhage        | Deleteriousness, excessive oral can decreased digestive function, cause vexation, naupatha, vomit | OR, EX               | 0           | 0.00 |
| Gentianaceae        | Gentiana scabra Bunge | Jin ti ya na       | Root, rhizome       | Methyl benzenecarboxylate, 1-octadecene, 1-hexadecane, 9-ecosol ene, 3-nitro-1,2-methylthiatic acid | D, Pi, Po           | Cocodylina, detoxification, demutemacene, acesodyne, paralysis, rables                          | Harmful to hot property of chest of body Remedy: centipede | OR, EX               | 1           | 0.01 |
| Iridaceae           | Crocus sativus L.    | Zai fa er          | Stigma              | Palmitic acid, palmitoleic acid, oleic acid, linoleic acid, linolenic acid, β-sitosterol | HP, S, D            | Dismayed, insomnia, congestion, amenorrhoea, anti-hypertension, heart disease, hysteroptosia, vitiologia | Harmful to kidney, can cause inappetence Remedy: anisum, vinagar syrup, amur corktree | OR, EX               | 21          | 0.24 |
| Lamiaceae           | Agastache rugosa (Fisch. et Mey.) O. Kuntze | Pin nai            | Aerial part         | Methylchavicol, anethole, anisaldehyde, patchouliacohol, β,β-pinene, d-linenone | Po, flower paste, S | Neurasthenia, gastro-intestinal disease, anti-hypertension, anemofrigid headache, toothache, eneache | Excessive oral can cause vertosity, dry throat Remedy: celery | OR, EX               | 2           | 0.02 |
| Lamiaceae           | Dracocephalum moldáva L. | Ba de ran ji bu ya qi ne | The whole plant     | Citral, geraniol, nerol, citronellol, thymol                                 | D, S, lotion        | Heart disease, vexation, dizziness, cough asthma, detoxification, halitosis                   | Harmful to hot property of body Remedy: acetic acid syrup | OR, EX               | 7           | 0.08 |
| Lamiaceae           | Lavandula angustifolia Mill. | Wu si tu hu du si | Aerial part         | Geraniol, safrole, carvacrol, linalool, citonellor                           | Essential oil       | Nervous system disease, paralysis, amnesia, melancholia, arthalgia                             | Harmful to hot property of body Remedy: acetic acid syrup | OR, EX               | 7           | 0.08 |
| Lamiaceae           | Melissa officinalis L. | Ba de ran ji bu ya qi ni | The whole plant     | Citral, crenol, gerasioli, linalool                                      | S, Pou, A           | Sterilization, stenocardia, anti-hypertension, anti-sepsis insect repellent                   | Excessive oral can cause ribs pain Remedy: gummi arabicum, mastic | OR, EX               | 0           | 0.00 |
| Lamiaceae           | Mentha canadensis L. | Ya li pu zi         | The whole plant, leaves | Methyl, menthone, thymol, canacrol, β-eugenolic acid, | HP, S, Pou           | Amenorrhoea, difficult urination, abdominal pain, expectorant                                  | Harmful to anus Remedy: gummi arabicum, grape vinegar | OR, EX               | 4           | 0.05 |

(continued)
| Family      | Latin names                              | Local names            | Parts used    | Main chemical composition of volatile oil                                        | Administration form | Traditional therapeutic indications                                                                 | The adverse reactions and remedy                                      | Way of administration | Use report | UV  |
|------------|------------------------------------------|------------------------|---------------|-----------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------|-------------|------|
| Lamiaceae  | Ocimum album L.                          | Ya wa re yi han        | The whole plant | Caryophylllic acid, eugenol, caryophyllene, methylcinnamate                        | D, S, Po, MO        | Anti-bacterial, anti-inflammatory, anti-viral (Jirovetz et al. 2009)                                | Excessive oral can cause dizziness, remedy: grape vinegar, cucumber, purslane | OR, EX                | 0           | 0.00 |
| Lamiaceae  | Ocimum basilicum L.                      | Re yi han              | Aerial part, seed | Ocimene, 1,8-cineole, linalool, geranial, methyl cinnamate                        | D, S, Pou           | Hepatopathy, cardiomus, melanodinia, paralysis, arthralgia, dianhaoa (Dhima et al. 2010)         | Harmful to eye, can reduce vision, Remedy: grape vinegar or purslane   | OR, EX                | 1           | 0.01 |
| Lamiaceae  | Ocimum gratissimum L. var. suave (Willd.) Hook. f. | Pai ran ji mu xi ke    | The whole plant | 3-Haxen-1-ol, thujene, sabine, 1,8-cymene, linalool, copaene                   | D, S                | Liver vacuity, palpitation, cold, antibiotic, mastitis, asthmatic asthma, expectorant (do Nascimento Silva et al. 2016) | Excessive oral can cause headache, stomach acid reflux, remedy: grape vinegar, viola tianshanica maxim | OR, EX                | 2           | 0.02 |
| Lamiaceae  | Origanum majorana L.                     | Mai er zan zhu xi      | The whole plant | Thymol, carvacol, geranyl acetate, 1,8-pinene, linalool                        | D, S                | Cold headache, palpitation, peripheral facial paralysis, intestinal obstruction (Hajlaoui et al. 2016) | Harmful to kidney bladder, remedy: purslane, chrysanthemum              | OR                    | 0           | 0.00 |
| Lamiaceae  | Petilia frutescens (L.) Britt. var. acuta (Thum.) Kudo | Ba lan gu              | The whole plant | Perillaldehyde, eisihottzia alcohol, menthaol, eugenol, linalool, olivil          | D, Po               | Heart deficiency, palpitation, vomitus gravidarium, threatened abortion, headache, chest tightness (Chen et al. 2004) | Harmful to stomach, remedy: white crystal sugar                       | OR                    | 1           | 0.01 |
| Lamiaceae  | Thymus vulgaris L.                       | A sha                  | The whole plant | Linalyl acetate, bomyl acetate, caryophyllene, thujanol-4, terpinen-4, borneol    | Pou, embrocation    | Liver vacuity, gastric asthmia, anuresis, amniousis, facial paralysis, asthma, haemoptysis (Youdim & Deans 1999) | Harmful to pneumoathy, remedy: concretio silicca bumbuse, ageratum       | OR, EX                | 0           | 0.00 |
| Lamiaceae  | Zaphora clinopodioides Lam.              | Su ze                  | The whole plant | β-Pinene, pulegone, β-citronellol, 1,8-cymenene, ylangene                      | D, MT, lotion       | Gold, fever, headache, palpitation, inomnina, oedema, sore throat, rickets, asynodia (Tian et al. 2012) | /                                                                     | OR, EX                | 0           | 0.00 |
| Lauraceae  | Cinnamomum cassia Pers.                  | Da er qin              | Dried bark     | Cinnamaldehyde, cinnamyl acetate, anisaldehyde, t-cinnamaldehyde, benzaldehyde, sallyaldehyde, (E)-farneisen, (E)-nerolidol, nerolidol | D, HP, Pou          | Stomach cold, diarrhea, dyspepsia, palpitation, venositis, hepatic asthma, asynodia (Tian et al. 2012) | Harmful to bladder, remedy: tragacanth gum or asarum europaeusm          | OR, EX                | 19          | 0.22 |
| Leguminosae | Dalbergia odorifera T. Chen               | Jiang xiang            | Trunk, heartwood | β-Bisabolone, (E)-farnesene, (E)-nerolidol, nerolidol                          | Pi, HP, A           | Traumatic injury, neurasthma, vexation, thermalgia, pyogenic infections (Ooi et al. 2006) | /                                                                     | OR, EX                | 0           | 0.00 |
| Leguminosae | Glycyrrhiza uralensis Fisch.             | Qu qu ke bu ya         | Root, rhizome  | Nonadecane, laran, ocadecane, (E)-pinane, cetyl epoxyethane, doxysine          | T, D, S            | Anaudia, asthma, cough, lung diseases, cold and fever detoxification, (Chen et al. 1998)        | Harmful to kidney and spleen, remedy: tragacanth gum and flos rosea     | OR, EX                | 13          | 0.15 |

(continued)
| Family       | Latin names                  | Local names                  | Parts used | Main chemical composition of volatile oil                                                                 | Administration form | Traditional therapeutic indications                                                                 | The adverse reactions and remedy                                                                 | Way of administration | Use report | UV  |
|-------------|------------------------------|------------------------------|------------|-----------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------|------------|-----|
| Leguminosae | Trigonella foenum-graecum L. | Shu mi sha ou ru he          | Seed       | Hexanol, heptanone, enanthal, cineole, thymol, camphor                                                      | D, Po, HP            | anti-tumour, antioxidant (Gong et al. 2015)                                                             | Lymphatic tuberculosis, hoarseness, amenorrhoea, hyposexuality, herpes (Goyal et al. 2016)      | OR, EX               | 1         | 0.01|
| Moraceae    | Ficus carica L.              | An ji er                    | Receptacle of inflorescence                               | Furfural, phenylacetaldehyde, 2-acetetylpyrrole, ethyl linoleate, linolenic acid, phytol | S, D                | Cough, inappetence, constipation, infantile paralyis, irregular menses, cacoctrophy (Harzallah et al. 2016) | Dyspepsia, arthritis, cold headache, pyocutaneous, asynodia, diarrhoea (Bajaj et al. 1993)       | OR                   | 1         | 0.01|
| Myristicae  | Myristica fragrans Houtt.     | Zhu you zhi seed            | Seed        | Sabinene, α,β-pinene, terpinen-4-ol, limonene, bornylene, β-phellandrene                                  | HP, S, Pou           | Dyspepsia, arthritis, abdominal distension, cough, headache, toothache, anti-inflammation               | Harmful to hot property of body Remedy: eat with coriander, Harmful to liver and lungs Remedy: eat with honey, viola tianshanica maxim | OR, EX               | 15        | 0.17|
| Myrtaceae   | Myrtus communis L.           | Ai bu li a si               | Fruit       | Pinene, camphene, cineole, cine, geraniol                                                                | S, HP, Po            | Gingival bleeding, haematuria, diarrhoea, hypermenorrhoea, abscess, trichomadesis (Ebahimbabadi et al. 2016) | Harmful to hot property of body Remedy: viola tianshanica maxim                               | OR, EX               | 2         | 0.02|
| Myrtaceae   | Syzygium aromaticum (L) Merr. et Perry | kai lan fu er              | Flower bud   | Eugenol, acetyl genesis, humulene, β-caryophyllene                                                        | Po, D, HP            | Gastric asphonia, dyspepsia, arthritis, paralysis, anemia (Dalai et al. 2014)                          | Harmful to hot property of body, kidney, and intestines Remedy: gummi arabicum                   | OR                   | 11        | 0.13|
| Nymphaeaceae| Nymphaea candida Presl        | Ni lu fa er                 | Flower       | /                                                        | D, S, lotion         | Heart deficiency, liver vacuity, cough, cold, vaxation, thirsty, anti-hypertension                     | Harmful to bladder, Remedy: honey, crystal sugar                                              | OR, EX               | 4         | 0.05|
| Papaveraceae | Papaver somniferum L.        | kuo ke na er po si ti      | Shell        | 2,4-Nonadienal, 2,4-decene aldehyde, cyclopentadecane, hexanal, docosane                                 | D, Po, S             | Cough, insomnia, cephalalgia, haematemesis, hemofacia, kidney injury, diarrhoea (Paul et al. 1996)    | Harmful to brain and pneumopathy patients Remedy: honey, fennel, granulated sugar, mastic       | OR                   | 17        | 0.20|
| Piperaceae  | Piper nigrum L.              | Mu qi                       | Fruit        | Piperonal, dihydrocarveol, caropyllene oxide, cryptone, phellandrene, cis-p-2,8-menthadienol              | HP, Pou, Po           | Dyspepsia, abdominal distension, cough, headache, toothache, anti-inflammatory                         | Harmful to hot property of body, can cause headache, dryness of the throat and lungs Remedy: cold property of oil | OR, EX               | 14        | 0.16|

(continued)
| Family       | Latin names                        | Local names | Parts used | Main chemical composition of volatile oil | Administration form | Traditional therapeutic indications | The adverse reactions and remedy | Way of administration | Use report | UV  |
|-------------|-----------------------------------|-------------|------------|------------------------------------------|---------------------|-------------------------------------|---------------------------------|------------------------|------------|-----|
| Ranunculaceae | *Nigella glandulifera* Freyn et Sint. | Si ya dan   | Seed       | Thymoquinone, nigellon                   | HP, Po, injection   | Vitiligo, amnesia, tremor, veribosity, bellyache, amenorrhea, oedema (Ghanemi & Boubertakh 2015) | Harmful to hot property of body, Remedy: eat after soaking in the grape vinegar | OR, EX                  | 7           | 0.08 |
| Ranunculaceae | *Paeonia lactiflora* Pall.         | Ke zi li chu hu lu ke | Root tuber | β-Phenylethyl alcohol, citronellol, hexenic aldehyde | HP, Pi, Po          | Epilepsy, paralyisis, psychosis, phobia, encephalitis, irregular menses (Wang et al. 2014) | Harmful to pregnant woman Remedy: nectar | OR, EX                  | 0           | 0.00 |
| Rosaceae     | *Agrimonia eupatoria* L.          | Ha pai si   | The whole plant | 3-Hydroxybutyric acid, α-bisabolol, ledoil, tetratriacontane, 2,6-di-tert-butylphenol | D, Po, Pou          | Chronic hepatitis, oedema, urination, eczema, alopecia areata | Harmful to spleen and testicle Remedy: anisum | OR, EX                  | 0           | 0.00 |
| Rosaceae     | *Crataegus pinnatifida* Bunge     | Du la nai   | Fruit      | Malic acid, palmitic acid, octadecanoic acid, limonene, chlorogenic acid | D, Po, S            | Gastroenteritis, dyspepsia, diarrhoea, dysentery, hepatic asthenia, hyperlipidaemia, (Li et al. 2010) | Harmful to kidney, gastric asthenia and enteropathy, patients, can cause headache, bowel infarction Remedy: anisum, fennel, ligaloes, qizil gulqent | OR, EX                  | 0           | 0.00 |
| Rosaceae     | *Eriobotrya japonica* (Thunb.) Lindl. | Luo ka ti   | Fruit      | Nerolidol, famesol, camphene, p,ymene, linalool, mycene | S,D                 | Fever, retch, vexation, thirsty (Ge et al. 2009) | Excessive oral can cause cough Remedy: hot property of food | OR                     | 0           | 0.00 |
| Rosaceae     | *Malus pumila* Mill.              | A li ma     | Fruit      | Farnesene, malic acid, ethyl salicylate, ethyl lactate, citronellol | S                   | Inappetence, constipation, diarrhoea, hepatic asthenia, gastric asthma (Bai et al. 2016) | Excessive oral can cause typhoid, amnesia, pneumatosis, muscle spasm Remedy: honey, cinnamon | OR, EX                  | 2           | 0.02 |
| Rosaceae     | *Prunus armeniaca* L.             | Ou nu ke    | Fruit      | Terpinenol-4, linalyl formate, ethyl myristate, γ-caprylacetone, isobutyrionic acid | S, infusion         | Dry stool, fever, stomach heat, haemorrhoids, thirsty (Lee et al. 2014) | Harmful to elderly persons and gastritis of insufficiency-cold patients Remedy: granulated sugar, anisum, ajo-wan-caraway seed | OR                     | 0           | 0.00 |
| Rosaceae     | *Prunus domestica* L.             | Ai nu la    | Fruit      | /                                               | Extract, D.S        | Fever, typhoid fever, pulmonary tuberculosis, tussication, acute laryngitis, diarrhoea, vitamin C deficiency (Baih et al. 2013) | Harmful to cold property of body, harmful to brain, gastritis patients remedy: mastic, honey water | OR                     | 0           | 0.00 |
| Rosaceae     | *Prunus persica* (L.) Batsch      | Sha pi tuo li | Fruit      | Malic acid, citric acid                        | D, Jam agent, MO    | Dry stool, typhoid fever, gastric asthenia, hepatic asthenia, thirst (Han et al. 2015) | Harmful to cold property of body Remedy: honey | OR, EX                  | 0           | 0.00 |
| Rosaceae     | *Pyrus sinkiangensis* Yu          | Nai xi pu ti | Fruit      | Ethyl butyrate, ethyl caprate, hexanol, ethyl palmitate, α-farnesene | S,D                 | Stomach heat, thirsty, coprostasis, weak health | Harmful to cold property of body and gastric asthenia patients | OR                     | 0           | 0.00 |

(continued)
| Family       | Latin names | Local names | Parts used       | Main chemical composition of volatile oil                                                                 | Administration form | Traditional therapeutic indications                                                                 | The adverse reactions and remedy                          | Way of administration | Use report | UV  |
|-------------|-------------|-------------|------------------|----------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------|------------|-----|
| Rosaceae    | Rosa chinensis Jacq. | Ai ti ni gu li | Flower bud       | Geraniol, nerol, citronellol, coriandrol                                                               | Flower paste       | Neurasthenia, gloomy, amenorrhea, anti-bacterial                                                     | Remedy: fennel, ginger                                    | OR                    | 0           | 0.00 |
| Rosaceae    | Rosa rugosa Thunb. | Ke zi li gu li | Petal            | Linalool, linalyl formate, l-limonool, citronenyl formate, l-damasone, roseoxide                         | D, T               | Hepatitis, neurasthenia, pilpitation and insomnia, megism, coproprostasis, myocarditis               | Excessive oral can cause sexual function decline          | OR, EX                | 19          | 0.22 |
| Rutaeeae    | Citrus limon Burm. | Li meng      | Fruit            | d-limonene, citral, gerangl-acetate, linalyl-acetate                                                   | S, D, Pou          | Dyspepsia, diarrhoea, nausea, vomit, gastric asthma, black shading                                   | Harmful to cold property                                  | OR                    | 1           | 0.01 |
| Rutaeeae    | Citrus medica L.  | Tu run ji po si ti | Pericarp         | Hesperidin, nobeletin, l-pherellamide, l-terpinene, cineole, camphene                                 | D, S, Po           | Dyspepsia, diarrhoea, nausea, vomit, gastric asthma, black shading                                   | Excessive oral can cause hot property of body headache    | OR, EX                | 0           | 0.00 |
| Rutaeeae    | Ruta graveolens L. | Suo za bi    | The whole plant  | l-Pinene, linalool, camphene, c-cymene, cineole, camphene                                           | HP, D, Po          | Dysuria, arthralgia, otalgia, convulsion, menstrual disorder, mental decline, paralyisis, vitiligo | Harmful to bladder                                          | OR, EX                | 2           | 0.02 |
| Rutaeeae    | Zanthoxylum bungeanum Maxim. | Ka ba bai qi ni | Pericarp         | Limonene, cumc alcohol, geranool, estragole, chavicol, methylethether                               | HP, Po, S          | Dyspepsia, gomphaxis, otalgia,resholdema, local anaesthesia, anti-inflammatory, insect repellent | Harmful to bladder                                           | OR, EX                | 3           | 0.03 |
| Schisandraceae | Illicium verum Hook.f. | Sha ka li ba di yang | Fruit            | Anethole, methylchavicol, safrole, 1,8-cineole, aubepine, fendone                                    | D, Pou             | Gastric asthenia, emesis, abdominal pain, lumbago due to deficiency of the kidney                  | Excessive oral can cause headache                          | OR, EX                | 0           | 0.00 |
| Smilacaceae | Smilax china L.  | Qie bi qi ni | Rhizome /        | /                                                          | HP, Po, S, D       | Headache, paralyisis, melancholia, arthralgia, hepatic asthenia, ahepnoea, scrotocele              | Harmful to hot property of body                           | OR                    | 3           | 0.03 |
| Solanaceae  | Lycium chinense Mill. | A li ha ti  | Fruit            | Ionone, benzil alcohol, phenethyl alcohol, methyl linoleate, methyl linoleate, 7,10,13-hexadeconetraenonic acid methyl ester | D, S               | Hypophthalmia, spermatorrhoea, hepatic asthenia, neurosis, hyperglycaemia, hyperlipidaemia           | Harmful to loosen stoo patients                            | OR                    | 0           | 0.00 |
| Styracaceae | Styrax benzoin Dryand. | Luo bang    | Balm             | Liquid storax, cinnamyl benzoate, vanilline, benzoic acid, a-cedrene                                  | Po, Pi, O          | Cold, cough, asthma, bronchictasis, kidney calculi, pyotaneous, haemorrhage, asyndia                | Harmful to hot property of body                           | OR, EX                | 0           | 0.00 |
| Family          | Latin names          | Local names         | Parts used | Main chemical composition of volatile oil                                                                 | Administration form | Traditional therapeutic indications                                                                 | The adverse reactions and remedy            | Way of administration | Use report | UV  |
|-----------------|----------------------|---------------------|------------|-----------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------|------------|-----|
| Thymelaeaceae   | Aquilaria agallocha  | Ou di yin di        | Resin wood | α-Agarofuran, α-agarol, agarapirin, jinkoheremol, kusunol, didikaranone                                    | S, D, Po           | Gastric atonia, arthralgia, halitosis, cough, asthma, hypnosis, (Bhuiyan et al. 2008)            | Harmful to hot property of body: clove, cassia twig, saffron, dushmanjipie fruit | OR, EX                | 4           | 0.05|
| Vitaceae        | Vitis vinifera L.    | Ou su he si zi ou zu mi | Fruit      | β-Myrcone, myrcene, hexenoic aldehyde, geran acid, p-toluene                                               | D, S, HP           | Constipation, hepatic atonia, asydonia, melancholia                                               | Harmful to hot property of body: remedy: acid fruit | OR                    | 2           | 0.02|
| Zingiberaceae   | Amomum tsao-ko       | Chong ka ke le      | Fruit      | α-β-Pinenone, α-terpinol, nerol, geranil, linalool                                                         | D, D, HP           | Stomach cold, anorexia, ventrity, diarheoa, loose stool                                           | Harmful to lungs: remedy: cube sugar excessive oral harmful to intestinal tract | OR                    | 7           | 0.08|
| Zingiberaceae   | Curcuma longa L.     | Ze qi wai           | Root       | Turmerone, arturmer(ne, zingiberene, phellandrene, sabinene                                               | D, HP, Po          | Traumatic injury, oedema, bronchadhe, cineole, cough, cataract, trachoma, asydona, dermatoasis  | Harmful to heart: remedy: lemon juice, orange juice | OR, EX                | 0           | 0.00|
| Zingiberaceae   | Elettaria cardamomum | La qin da nai       | Fruit      | Terpineol-4, α-terpineol, terpinylacetate, cineole                                                          | D, HP              | Gastric atonia, oestersmia, dyspepsia, ventrity, vomit, nausea, belljache, palipitate            | Harmful to lungs: remedy: tragacanth gum, concreto silicea bambuse | OR, EX                | 4           | 0.05|
| Zingiberaceae   | Zingiber officinalis | Zan le bi li        | Rhizome    | α-zingiberene, geranil, geranil, isogingere-none, hexahydocurumin, 6-gingerol                              | Pi, Po, Pou        | Gastric atonia, anemofrigid cold leucorrhage, asydonia, loose stool                              | Harmful to throat: remedy: honey           | OR, EX                | 12          | 0.14|

Administration form: S: syrup; HP: honey paste; Pou: poultice; Pi: pill; Po: powder; D: decoction; A: apozem; MO: medicinal oil; MT: medicinal tea; T: tablet.
Way of administration: OR: oral EX: external.
/No up-to-date report was there on these aspects.
characteristics that are conducive to supplying the body with necessary nutrients and particular trace elements.

In our survey, plants such as lavender, saffron crocus and mint were found to be commonly used. Lavender essential oil made from lavender plants is good for nervous system disease, paralysis, amnesia, melancholia and arthralgia. Meanwhile it has anti-inflammatory and anti-bacterial functions. The lavender essential oil treatment balanced the inflammatory signaling induced by \textit{S. aureus} by repressing the principal pro-inflammatory cytokines and their receptors and inducing the heme oxygenase-1 gene transcription. The essential oil can stimulate the human innate macrophage response to a bacterium, which is responsible for one of the most important nosocomial infection (Giovannini et al. 2016). Saffron crocus is a kind of common, traditional precious herb among local aromatic medicinal plants. Saffron crocus have anti-oxidant, analgesic, anti-inflammatory, anti-diabetic and several other properties. The kaempferol 3-O-rutinoside and kaempferol 3-O-glucoside from saffron crocus treatment increased the level of total protein and prevented the carbon tetrachloride-induced increases in serum aspartate aminotransferase, serum alkaline phosphatase and hepatic malondialdehyde levels. And, it has protective effects against acute carbon tetrachloride-induced oxidative liver damage (Wang et al. 2015). Mint presents a wide range of uses; its basic pharmacology involves anti-pyretic and anti-sweating effects. Mint is both a medicinal and culinary herb, employed in mint condiments, spices, teas and so on. There were many aromatic plants identified during this survey that present unique characteristics and play specific roles in the medical community.

Intake of aromatic medicinal plants

According to the results of our study, the most common methods of application are oral and external, accounting for 72.2% of applications, while 23 of the aromatic plants can be used as oral medicines (26.8%), whereas only one plant, \textit{Nerium indicum} Mill., was reported to be employed only as an externally applied drug (Qian et al. 2005). Under some circumstances, oral and external treatments can better cure disease.

Table 2. Frequency of plant species by family used for medicinal purposes in the study area.

| Family         | Frequency | Family          | Frequency |
|----------------|-----------|-----------------|-----------|
| Acoraceae      | 1         | Leguminosae     | 3         |
| Amaryllidaceae | 1         | Gentianaceae    | 1         |
| Apiaceae       | 10        | Moraceae        | 1         |
| Apocynaceae    | 1         | Myristicaceae   | 1         |
| Araliaceae     | 2         | Myrtaceae       | 2         |
| Areaceae       | 2         | Nymphaeaceae    | 1         |
| Aristolochiaceae | 1           | Papaveraceae    | 1         |
| Brassicaceae   | 2         | Piperaceae      | 1         |
| Burseraceae    | 1         | Ranunculaceae   | 2         |
| Compositae     | 7         | Rosaceae        | 10        |
| Cucurbitaceae  | 2         | Rutaceae        | 4         |
| Cupressaceae   | 1         | Schisandraceae  | 1         |
| Elaeagnaceae   | 2         | Smilacaceae     | 1         |
| Ephedraceae    | 1         | Solanaceae      | 1         |
| Euphorbiaceae  | 1         | Styracaceae     | 1         |
| Iridaceae      | 1         | Thymeleaceae    | 1         |
| Lamiaceae      | 12        | Vitaceae        | 1         |
| Lauraceae      | 1         | Zingiberaceae   | 4         |

Figure 2. Aromatic Uyghur medicinal plants and field interview. (a) \textit{Gentiana scabra} Bunge, (b) \textit{Papaver somniferum} L., (c) commercially available \textit{Artemisia rupestris} L., (d) field interview about \textit{Ziziphus clinopodioides} Lam., (e) field interview about aromatic Uyghur medicinal plants in ethnological hospital, (f) field interview about \textit{Melissa officinalis} L. with retired ethnological doctor.

Figure 3. Frequency of aromatic Uygur medicinal plants parts used by the village people of Xinjiang.
Additional description of introduced aromatic medicinal materials

Families and plant parts

In the present study, some of the medicinal plants we investigated were not native materials. We identified 34 introduced plants, belonging to 24 families, coming from different regions, such as surrounding areas of Europe and the Mediterranean (Souza et al. 2014). Zingiberaceae was the family accounting for the greatest percentage of introduced medicinal materials (25.00%), followed by Rutaceae (20.83%), Lamiaceae (16.67%), Rosaceae (12.50%). Fruits (22.73%) are the most widely used part of the plant, followed by the whole plant (15.91%), roots (13.64%) and seeds (6.82%).

Remedy of aromatic plants, administration form and route

Aromatic plants are vital as remedies and in the economic development of Xinjiang. Introduced plants can be used to treat diseases such as colds, gastric diseases and asthma. The most important form of administration of these plants is decoction, similar to findings for native medicinal plants, while the oral administration route is used for every plant. Compared with the native plant species employed in Xinjiang, some introduced plants present specific functions in local use (Di Novella et al. 2013).

Conclusions

This study first recorded use information on aromatic plants employed in traditional Uyghur medicine in Xinjiang, demonstrating that Xinjiang possesses various raw medicinal herbs. A total of 86 kinds of aromatic plants used by local people belonging to 36 genera were identified, and these plants are still commonly used in daily life. To evaluate the value of the medicinal plants in the target region, the UV was employed in a quantitative analysis. Many plants are used to relieve coughs, eliminate phlegm in treating cardiovascular diseases, colds, haemorrhoids, constipation, stomach diseases, diabetes, urinary diseases, respiratory conditions and throat disease. Therefore, Xinjiang is an area where indigenous medicinal plants present diverse uses, and a sound dimensional medical healthcare treatment system has been developed in this region.

However, some of the traditional Uyghur medicines used in this region still lack physiotherapeutic evidence. Hence, analysis of the chemical constituents and pharmacological activities of certain Uyghur medicines are necessary to explore the potential of Uyghur medicinal plants. This study also provides protection for the local medicinal plant group. Some Uyghur medicinal plants are on the verge of extinction because of frequent natural disasters and the development of urbanization, and the UV of these plants therefore cannot be presented. Thus, the development of further strategies for the conservation of these medicinal plants should be of priority.

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Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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Figure 4. Administration form of aromatic Uygur medicinal plants by village people to treat various ailments.
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