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# Review on the indigenous use and ethnopharmacology of hot and cold natures of phytomedicines in the Iranian traditional medicine

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## ABSTRACT

**Objective:** According to our best knowledge, this is the first and also a relatively comprehensive review on the cold and hot (or warm) nature of common Iranian traditional herbal medicines, based on the evidence-based and directly collected from the user and native-healers, instead of reviewing the classical texts of Iranian traditional medicine. This column resulted from a wide field study on the common Iranian traditional herbal medicine for their so-called effects of cold, hot and also balanced natures, used currently among ethno-pharmacologists, herbal-drug sellers and rural native-healers. **Methods:** The junior medical students were grouped into several groups for data collection. The information gathered from ethno-pharmacologists, herbal-drug sellers and rural native-healers, from different regions of Iran, especially Northwest, Southwest, Central and Northern provinces. For each repeated report of a certain indication, we added “a point” to the specification of that plant. If the number of every reported indication was, more than 5–20 times we reported that indication or pharmacological effect in our final report in this article.

**Results:** Here we presented 61 plants currently used in Iranian traditional herbal medicine. The data recorded for every plant included: scientific name, family names, English name, Persian name, therapeutic nature (cold, hot or balanced), suggested actions and pharmacology, indication and usage, used parts/preparation, mode of administration. The plants were grouped into 25 families. Of a total 61 plants 16 were with cold (26%) and 43 were with hot nature (70%) and the rest were with balanced nature (4%). **Conclusions:** Almost of them have been long used as the components of the ancient receipts, hence, they may be more readily tried as suitable candidates in the future modern pharmacological investigations. Nevertheless, almost of them have been already evaluated in pharmacological laboratories, and their efficient properties have been confirmed. Considering the pharmacological properties of these plants, for finding a clear correlation of the pharmacological activities with the hot or cold nature, more detailed studies need to be conducted.

## 1. Introduction

The authors of this paper have already published separately the results of some of their field studies on the cold, hot and also balanced natures of the common Iranian traditional herbal medicine [1–2]. Finally, this is a review resulted from merging the data of both before published works. Here we presented 61 plants currently used in Iranian traditional herbal medicine. Almost of them have been long used as the components of the ancient receipts, hence they may be more readily tried as suitable candidates in the future modern pharmacological investigations. Nevertheless, almost of them have been already evaluated in pharmacological laboratories, and their efficient properties

have been confirmed [3–10].

This is a wide field study on the common Iranian traditional herbal medicine for their so-called effects of cold, hot and also balanced natures, used currently among ethno-pharmacologists, herbal-drug sellers and rural native-healers. The results in both papers of the same authors have been emerged and the data from other authors were added. The today knowledge of herbal medicine in Iran lies on a robust fundamental, which dates back to more than 2000 years of the indigenous treasure of the herbal knowledge. For more details in the history of Persian medicine see the references [11–12].

The practice and study of medicine in Persia has a long and prolific history. The Iranian academic centers like Jundishapur University (3rd century AD) were a breeding ground for the union among great scientists from different civilizations. Reviewing the splendid Persian history in pharmacy and pharmacology in book of “Arabian Medicine” of Edward Browne, we read that: it was in the middle of the eighth century of our era and through the then newly-

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founded city of Baghdad that the great stream of Greek and other ancient learning began to pour into the Muhammadan world and to reclothes itself in an Arabian dress. And so far as Medicine is concerned, the tradition of the old Sasanian school of Jundi–Shapur was predominant [11].

Of this once celebrated school, now long a mere name, with difficulty located by modern travelers and scholars on the site of the hamlet of Shah–abad in the province of Khuzistan in Southwestern Persia, a name which was gradually converted into Gundē Shapur or in Arabic Jundi Sābūr. The great development of the school of Jundi–Shapur was, however, the unforeseen and unintended result of that Byzantine intolerance which in the fifth century of our era drove the Nestorians from their school at Edessa and forced them to seek refuge in Persian territory. In the following century the Khusraw Anushīrwān, sent his physician Burzuya to India, who brought back Indian works on medicine and apparently, Indian physicians to Persia.

According to our best knowledge, this is the first and also a relatively comprehensive review on the cold and hot (or warm) nature of common Iranian traditional herbal medicines, based on the evidence–based and directly collected from the user and native–healers, instead of reviewing the classical texts of Iranian traditional medicine.

## 2. Material and Methods

For data collection, the junior medical students were grouped into several groups. Then, the information gathered from ethno–pharmacologists, herbal–drug sellers and rural native–healers, from different regions of Iran, especially Northwest, Southwest, Central and Northern provinces. All

data were collected and summarized for every species. For each repeated report of a certain indication, we added “a point” to the specification of that plant. If the number of every reported indication was, more than 5–20 times we reported that indication or pharmacological effect in our final report in this article. We thought that, the higher frequency of the reports of an activity or indication might mean the most reliable applications of that plant in Iranian traditional medicine. We report here, the plants used in Iranian traditional herbal medicine with cold nature.

## 3. Results

61 species received the higher points as hot, cold and balanced natured plants in Iranian traditional herbal medicine. Of them, 17 plants were recognized as cold, 43 plants as hot and a single plant as balanced nature. These herbs are presented here with their specifications in the Tables. We have summarized the collected data as scientific name, Family names, English name, Persian name, therapeutic nature (cold, hot or balanced), suggested actions and pharmacology, indication and usage, used parts/preparation, mode of administration. Other comments added in the end of the represented data. These data have been summarized in the Table 1, for the specifications and information of hot, cold and balanced herbal plants in currently used Iranian herbal medicine.

## 4. Discussion

We mentioned above that the Iranian schools of pharmacy

**Table 1.** The specifications and information of hot, cold and balanced herbal plants in currently used Iranian herbal medicine.

Scientific name	Family	English name	Persian name	Nature	Suggested Actions and pharmacology	Indication and Usage	Used parts/ preparation	Mode of Ad
<i>Achillea millefolium</i> L.	Compositae	Milfoil, Yarrow	Būmādarān	Hot	Energizer, anticonvulsive, nerve tonic, cardiac tonic, Antihemorrhoidic.	Gastritis, enteritis, rheumatoid arthritis, gout, premature menorrhoea syndrome (PMS), angina pectoris.	Infusion of the leaves.	Take a cup before meals.
<i>Aleo vera</i> L.	Liliaceae	Common aloe	Sabr-e-zard	Neutral, balanced	cardiac tonic, gastric tonic, kidney and liver protector.	Acne, itching, eczema, dermal hyper-sensitivity, internal infections, skin wrinkles.	Infusion of the leaves.	2–3 cups is taken between meals.
<i>Alhagi persarum</i> Boiss. & Buhse.	Papilionaceae	Camel's thorn	Taranjabin, Khār-shotor	Cold	Potent diuretic, antilithiastic	Urinary tract infections (UTIs)	Infusion of the leaves	Take a glass before meals
<i>Allium sativum</i> L.	Liliaceae	Garlic	Sir	Hot	Hypolipidemic, hypoglycemic, antibacterial, antineoplastic.	Antidote for nicotine poisoning and air pollution.	Infusion of the leaves.	Take a cup after meals and it is taken before bed.
<i>Althaea officinalis</i> L.	Malvaceae	Marsh mallow, white mallow	(Gol-e-) Khatmi	Cold	Skin softener, nerve tonic.	Asthma, bronchitis, pharyngitis, myalgia, cystitis, urinary retention	Infusion of the leaves.	Take 2–3 cups between meals.
<i>Anethum graveolens</i> L.	Umbelliferae	Common dill, anet	Shevid	Hot	Hypolipidemia, Lactigenic, gastric tonic.	Hypercholesterolemia, obesity, bloating, hiccup, abdominal pain, amenorrhoea, dyspnea, back-ache, cystitis, nephritis.	Infusion of the leaves.	Take a glass before meals.
<i>Anthemis nobilis</i> L.	Compositae	Chamomile flowers	Bābūneh	Hot	Gastric tonic, disinfectant, nerve tonic, anthel.	Acne, dysmenorrhoea.	Infusion of the leaves.	Take a cup after meals.
<i>Apium graveolens</i> L.	Umbelliferae	Garden celery	Karafs	Cold	Antihemorrhoidic, antilithiatic, diuretic, gastric tonic, energizer, hypuricemic.	Rheumatoid arthritis, arthralgia, bloat, gout, hypertension.	Infusion of the leaves.	2–3 cups is taken daily.
<i>Arctium lappa</i> L.	Compositae	Burdock, Clot-bur	Bābā-ādam	Hot	Diuretic, blood tonic.	kidney insufficiency, gout, rheumatoid arthritis, measles, scarlet fever.	Infusion of the leaves.	Take a cup after meals.
<i>Artemisia absinthium</i> L.	Compositae	Common wormwood, absinthium	Efesentīn	Hot	Appetizer, antipyretic, sedative, vasodilator, anthelmintic.	Anorexia, internal disease, constipation.	Infusion of the leaves.	Take a cup after meals.
<i>Carum carvi</i> L.	Umbelliferae	Caraway	Zireh-siyāh, Zireh	Hot	Hypolipidemic, digestive, Lactigenic, antiparasitic.	Bloating, hyperlipidemia.	Infusion of the leaves.	Take 1/2 cup after meals.
<i>Cichoriuna intybus</i> L.	Compositae							
	Common chicory, Succory	Kāsnī	Cold	Liver tonic, blood tonic, hypolipidemic, hypoglycemic, kidney tonic, dermal tonic, rich of vitamin C, antihyperthermic, vasodilator	Acne, itching, arthralgia.			

	Infusion of the leaves.	Take a glass before meal.	It ameliorates the arthralgia due to the warm nature of the patient.					
Cinnamomum zeylanicum Nees.	Lauraceae	Cinnamon tree	Därchin	Hot	Nerve tonic, gastric tonic.	Impotency, productive cough, anxiety, unpleasant mouth smell.	Infusion of the leaves.	Take 1/2 cup after meals.
Citrus medica L.	Rutaceae	Citron tree	Otroj, Toranj	Hot	Analgesic, antispastic	Infections, vomiting, diarrhea, hiccup, vitamin C requirement.	Infusion of the leaves.	Take a cup after meals.
Citrus aurantium L.	Rutaceae	Sour orange, Seville orange.	Bahär-närenj	Hot	nerve tonic, mind refresher, anticonvulsive, sedative, antidepressive.	Histeria, depression, neurological disorders, insomnia, hiccup.	Infusion of the leaves.	2-3 cups is taken between meals and it is taken before bed.
Coriandrum sativum L.	Umbelliferae	Coriander, Cellender	Geshnüz	Cold	Athelminthic, antimicrobial	Bloating, gastrointestinal infections, specially: helicobacter pylori infecyion, oral aphthus, acne, liver disorders	Infusion of the leaves.	Take a cup before meal.
Cornulaca monacantha Delle.	Chenopodiaceae	-	Tärün, tärüneh	Cold	Potent hypnotic, nerve tonic, sedative.	Rheumatoid arthritis, arthralgia It is along with Citrus aurantium a potent hypnotic.	Infusion of the leaves.	Take 1/2 cup before meal.
Crataegus azarolus L.	Rosaceae	Azorole hawthorn	Kyälak, Zälzälak-e-zard	Cold	Blood tonic, blood tonic, vasodilator.	Hypercholesteronemia, hiccup, vertigo.	Infusion of the leaves.	Take a cup before meal.
Crocus sativus L.	Gramineae	Saffron, Crocus	Za'farän	Hot	Odorant, energizer.	Dyspepsia, heart-burn.	Infusion of the leaves.	Take a cup before meals.
Cuminum cyminum L.	Umbelliferae	Cumin, Cummin	Zireh-sabz	Hot	Lactigenic, blood tonic, digestive, antiparasitic.	Bloating	Infusion of the leaves.	Take 1/2 cup after meals.
Dianthus persicus Hausskh.	Caryophyllaceae	Pink, Carnation	Mikhak	Hot	Nerve tonic, expectorant	Headache, toothache, gingivitis, production cough, dyspnea	Infusion of the leaves.	Take a cup after meals.
Dracocephalum moldavica L.	Labiatae	Moldaviam dragon head, Moldaviam balm	Bädranjbüyeh	Hot	anticonvulsive, stress relieving, cardiac tonic, nerve tonic, hematopoetic, hypnotic.	Pregnancy vomiting, neurological disorders, bronchitis, colic, abdominal spasm, insect stings.	Infusion of the leaves.	Take a cup after meals.
Echium amoenum Fisch. & Mey.	Boraginaceae	Viper's bugloss	Gol-e-gävzabän	Hot	Cardiac tonic, nerve tonic, potent analgesia, skin refresher, antiparasitic.	Nephritis, nerve tonic, myalgia.	Infusion of the leaves.	Take a cup after meals and it is taken before bed.
Elettaria cardamomum Marton.	Zingiberaceae	Lesser cardamom, Bastard cardamom	Hël	Hot	Gastric and enteritis tonic, odorant as perfume.	Headache, unpleasant mouth smell, specially for removing the garlic smell.	Infusion of the leaves.	Take ½ a cup after meals.
Foeniculum vulgare Miller.	Umbelliferae	Common fennel	Räziyäneh	Hot	Diuretic, Lactigenic, odorant.	Bloating, gout, hemorrhoids, colic, amenorhea. It ameliorates the phlegmatic signs.	Infusion of the leaves.	Take 1/2 cup after meals.
Glaucium spp. Miller	Papaveraceae	Horn poppy	Shaghâyagh	Hot	Sedative, relaxant, antidepressant.	Anxiety	Infusion of the leaves.	Take a cup after meals and it is taken before bed.
Glycyrrhiza glabra L.	Papilionaceae	Liquorice	Shirin-bayän	Hot	Antitussive, cholagogue, tonic of alimentary tract, expectorant, antihemorrhoidic.	Gastric and duodenal peptic ulcer disease, heart-burn, laryngitis, Kidney and pulmonary infections, constipation.	Infusion of the leaves.	Take a glass after meals.
Heracleum persicum Desf.ex Fischer.	Umbelliferae	Persian cow-parnsnip	Golpar	Hot	Digestive, antimicrobial, uretic, nerve tonic, odorant.	bloating	Infusion of the leaves.	Take a cup after meals.
Hyssopus angustifolius M.B.	Labiatae	Hyssop	Zöfä	Hot	Expectorant, pulmonary tonic, astringent, gastric tonic, blood tonic.	Common cold, asthma, hypersensitivity, bloating	Infusion of the leaves.	Take 1/2 cup after meals.
Ipomea purpurea (L.) Roth	Convolvulaceae	Common morning glory	(Gol-e-) Nilüfar	Cold	Blood tonic, antitussive	Pulmonary disorders, dysentery, cystitis, nephritis, dysuria, common cold, head-ache, baldder hemorrhagia, pulmonitis	Infusion of the leaves.	Take 2-3 cups between meals.
Juglans regia L.	Juglandaceae	Persian walnut	(Barg-e-) Gerdü	Hot	Hypoglycemic, anti-inflammatory.	Gout, arthralgia.It ameliorates the arthritis due to the cold nature of the patient.	Infusion of the leaves.	Take a cup before meals.
Lactuca sativa L.	Compositae	Lettuce	Kähü	Cold	Erythropoetic, antimycobacterial	Anemia, tuberculosis, gastritis, alopecia.	Infusion of the leaves	Take a cup before meal.
Lavandula vera DC.	Labiatae	Lavender	Ostokhoddüs	Hot	Nerve tonic, antipyretic, energizer, anticonvulsive, hypnotic.	Bronchitis, coryza, epilepsy, seizures, neurological disorders, headache, vertigo, tremor, head trauma, amnesia, gout, respiratory tract infections, grippe.	Infusion of the leaves.	2-3 cups is taken between meals and it is taken before bed.
Malva sylvestris L.	Malvaceae	High mallow, marsh mallow	Panirak	Cold	Lactigenic, sedative, diuretic, laxative, pulmonary tonic, antipyretic	Kidney insufficiencies, enema for proctitis	Infusion of the leaves	Take 2 cups between meals
Medicago sativa L.	Papilionaceae	Alfalfa, Lucerne, cultivated medick.	Yonjeh	Hot	Fattener, energizer, blood tonic, hypoglycemic.	Anorexia, tremor, neurological disorders.	Infusion of the leaves.	Take ½ a cup before meals.
Melilotus officinalis (L.) Desr.	Papilionaceae	Yellow sweet clover, Melilot	Näkhonak	Cold	Cardiac tonic, nerve tonic, mind refresher	Kidney insufficiencies	Infusion of the leaves.	Take a cup after meals.
Mentha piperta L.	Labiatae	Peppermint, Lamb-mint, black mint.	Na'nä	Hot	Gastrotonic for children, hematopoetic, anticonvulsive.	Abdominal pain, bloating, anorexia, hyperthermia of the children, hiccup.	Infusion of the leaves.	Take a cup after meals.
Mentha pulegium L.	Labiatae	Penny royal, Pudding herb	Püneh	Hot	Expectorant, astringent, vasodilator, disinfectant, antidiarrheal.	Grippe, pertussis, bloating, anorexia, heart-burn.	Infusion of the leaves.	Take a cup before meals.
Myrtus communis L.	Myrtaceae	Common myrtle	Mord, Murd	Cold	Antihemorrhagic, astringent, hair growth improving tonic.	diarrhea, hemorrhoids, oral aphtha.	Infusion of the leaves.	Take 2 cups between meals.
Nigella sativa L.	Ranunculaceae	Garden fennel-flower, Black cumin	Siyäh-däneh	Hot	Antisepticemic, antiparasitic, antidiarrheal, gastric tonic, antifungal, hypoglycemic, hypolipidemic.	Heart-burn, bloating, infection, withdrawal syndrome of narcotic addiction, enteritis, tremor, complications of paralysis.	Infusion of the leaves.	Take 1/2 cup after meals. Also 2 cups is taken daily.
Ocimum basilicum L.	Labiatae	Sweet basil, basil	Shäh-sparän, Reyhän-sabz	Hot	Sedative, cardiotoxic, hematopoetic.	Diarrhea, bloating	Infusion of the leaves.	Take a cup after meals.
Olea europaea L.	Oleaceae	Common olive	(Barg-e-) Zeyt n	Cold	Hypotensive, tonic, astringent, diuretic, antipyretic, hypoglycemic, liver protective, memory booster	Liver disorders, headache, tooth-ache	Infusion of the leaves	Take a cup before meals
Pimpinella anisum L.	Umbelliferae	Anise	An s m	Hot	Anthelminthic.	Nausea, bloating.	Infusion of the leaves.	Take a cup after meals.
Platanus orientalis L.	Platanaceae	Plane tree	(Bargeh-) Chenär	Cold	Antipyretic, bronchodilator, nerve tonic, appetizer, fattener, skin refresher	Dyspnea, pharyngitis, neurological disorders, anorexia	Infusion of the leaves	Take a cup before meals
Rosa canina L.	Rosaceae	Common briar, Dog rose, Hip rose	Nastaran kühî	Hot	Nerve tonic, cardiotoxic, antidiarrheal, blood tonic.	Vitamin C requirement, palpitation, nephritis, heart-burn, scurvey.	Infusion of the leaves.	Take a cup before meals.
Rosa damascena Mill.	Rosaceae	Damask rose, Persian rose	(Gol-e-) Goläb, Gol-e-Mohammadi	Hot	Odorant, expectorant, cardiotoxic, gastric tonic, laxative, Lactigenic.	Fatigue, hemoptesia, gingivitis, pulmonary disorders.	Infusion of the leaves.	Take a cup before meals it is taken before bed.

Rosemarinus officinalis L.	Labiatae	Rosemary	Roz-māri	Hot	liver protective, gastric tonic, hepatitis.	pertussis, vertigo, jaundice.	Infusion of the leaves.	Take 2 cups between meals.
Salix aegyptiaca L.	Salicaceae	Egyptian willow	Bid-meshk	Hot	Cardiotonic, nerve tonic, laxative.	Neurological disorders, palpitation, congestive, heart failure.	Infusion of the leaves.	2-3 cups is taken between meals and it is taken before bed.
Salix babylonica L. and other spp.	Salicaceae	Willow spp.	Bid	Cold	blood tonic, gastric tonic, sedative, cardiac tonic, anticonvulsive	Severe fever, venereal pain, jaundice, dandruff	Infusion of the leaves	2-3 cups is taken daily
Salvia officinalis L.	Labiatae	Garden sage	Maryam-goli	Hot	Anti-inflammatory effects	Bloating, paranasal sinusitis, parasitism, nephrolithiasis, splenitis, gastritis, enteritis.	Infusion of the leaves.	Take a cup after meals.
Satureja hortensis L.	Labiatae	Summer savory, annual savory	Marzeh	Hot	Alimentary tonic	Osteoporosis, parasitism, gout, colic pains.	Infusion of the leaves.	Take a cup before meals.
Tanacetum parthenium (L.) Schultz-Bip	Compositae	Feverfew chrysanthemum	Bābūneh-gāvi, Makhlash	Hot	Antidote against poisoning, Laxative, gastric tonic.	Colic pain, backache, myalgia, arthralgia.	Infusion of the leaves.	Take a cup after meals.
Teucrium polium L.	Labiatae	Cat thyme, Poley	Kalpūreh	Hot	antidiarrheal, hypnotic, antiparasitic, antifungal, antitussive.	Diabetes mellitus, rheumatoid arthritis, paranasal sinusitis, bloating, menorrhage, discharge, wound disinfection, gingivitis, tonsillitis, acne, itching, dyspepsia, amenorrhea.	Infusion of the leaves.	Take a cup after meals.
Thymus vulgaris L.	Labiatae	Garden thyme	Āvisham	Hot	Hypoglycemic, hypolipidemic, gastric tonic, antifungal, analgesic, anticonvulsive, blood tonic.	Common cold, dermatophytic infections, pulmonary infections, rhinitis, pharyngitis, heart-burn, vision disorders, bronchitis.	Infusion of the leaves.	Take ½ cup after meals.
Tribulus terrestris L.	Zygophyllaceae	Land caltrops, Turkey-blossom, Puncture vine	Khārkhāsak, Khārkhasak		Potent diuretic, antilithiasis	Bladder and kidney calculi, cholelithiasis, blood tonic, prostatitis	Infusion of the leaves	Take a cup before meals
Trigonella foenum-graecum L.	Papilionaceae	Fenugreek trigonella	Shanbalīeh	Hot	Hypolipidemic, hypoglycemic, energizer, fatterer, hair growth improver.	Sexual impotency, bloating, anorexia, anemia, alopecia, osteopenia.	Infusion of the leaves.	Take a cup before meals.
Urtica dioica L. var. dioica	Urticaceae	Stinging	Gazaneh	Hot	hypolipidemic, hypoglycemic, antihemorrhagic, vasodilator, diuretic, energizer, lactigenic.	Skin diseases, dyspnea, gingivitis, amenorrhea.	Infusion of the leaves.	Take a cup before meals.
Valeriana officinalis L.	Valerianaceae	Common valerian	Sonbol-ot-Teyb	Hot	Hypnotic, anti-hysterical, cardiac tonic, sedative, energizer.	Asomnia, Migraine headache, anorexia, diabetes mellitus, anxiety, phobia, enteritis.	Infusion of the leaves.	Take 1/2 cup after meals.
Viola odorata L.	Violaceae	Sweet violet, Violet	(Gol-e-) Banafsheh	Cold	Expectorant	Common cold, asthma, pulmonary disorders.	Infusion of the leaves.	Take a cup after meal.
Zingiber officinale Rose.	Zingiberaceae	Ginger, Official ginger	Zanjabil	Hot	Expectorant, cholagogue.	Rheumatoid arthritis, myalgia, nausea, tissue tonic.	Infusion of the leaves.	Take 1/2 cup after meals.
Ziziphora persica Bunge.	Labiatae	Field-basil, Ziziphora	Kākūti	Hot	Antifungal, gastric tonic, antiparasitic.	Sciatic pain, respiratory tract infections, dyspepsia, anorexia, vision disorders.	Infusion of the leaves.	Take a glass daily.

were in a prominent degree. Nevertheless, some fluctuations occurred. The school of Jundi-Shapur was, then, at the time of the Prophet Muhammad's birth, at the height of its glory. There converged Greek and Oriental learning, the former transmitted in part directly through Greek scholars, but for the most part through the industrious and assimilative Syrians, who made up in diligence what they lacked in originality. Sergius of Ra'su'l-'Ayn, who flourished a little before this time, was one of those who translated Hippocrates and Galen into Syriac. Of this intermediate Syriac medical literature, from which many, perhaps most, of the Arabic translations of the eighth and ninth centuries were made, not much survives, but M. H. Pognon's edition and French translation of a Syriac version of the Aphorisms of Hippocrates, and Dr Wallis Budge's Syriac Book of Medicines, enable us to form some idea of its quality. To the Syrians, whatever their defects, and especially to the Nestorians, Asia owes much, and the written characters of the Mongol, Manchu, Uyghur and many other peoples in the western half of Asia testify to the literary influence of the Aramaic peoples.

But though the medical teaching of Jundi-Shapur was in the main Greek, there was no doubt an underlying Persian element, especially in Pharmacology, where the Arabic nomenclature plainly reveals in many cases Persian origins. But the two most glorious periods of pre-Islamic Persia, the Achaemenian (B.C. 550–330) and the Sasanian (A.D. 226–640) both terminated in a disastrous foreign invasion,

Greek in the first case, Arab in the second, which involved the wholesale destruction of the indigenous learning and literature, so that it is impossible for us to reconstitute more than the main outlines of these two ancient civilizations. Yet the Avesta, the sacred book of the Zoroastrians, speaks of three classes of healers, by prayers and religious observances, by diet and drugs, and by instruments; in other words priests, physicians and surgeons. As regards the latter, one curious passage in the Vendidd ordains that the tyro must operate successfully on three unbelievers before he may attempt an operation on one of the "good Mazdayasnian religion." And, of course, Greek physicians, of whom Ctesias is the best known, besides an occasional Egyptian, were to be found at the Achaemenian court before the time of Alexander of Macedon. The medical school of Jundi-Shapur seems to have been little affected by the Arab invasion and conquest of the seventh century of our era, but it was not till the latter half of the eighth century, when Baghdad became the metropolis of Islam, that its influence began to be widely exerted on the Muslims [13–17].

Now, considering the great history of Iranian traditional medicine, we summarized the results of the study as follows: Of a total 61 plants 16 were with cold (26%) and 43 were with hot nature (70%) and the rest were with balanced nature (4%). The plants were grouped in 25 families, including: Boraginaceae, Caryophyllaceae, Chenopodiaceae, Compositae (7), Convolvulaceae, Gramineae, Juglandaceae, Labiatae (11), Liliaceae (2), Malvaceae (2), Myrtaceae,

Oleaceae, Papaveraceae, Papilionaceae (5), Platanaceae, Ranunculaceae, Rosaceae (5), Rutaceae, Salicaceae, Umbelliferae (8), Urticaceae, Valerianaceae, Violaceae, Zingiberaceae (2), Zygophyllaceae (the numbers more than one member for each family have been mentioned in the parenthesis). These results are comparable with other studies on herbal medicines in different regions worldwide [18–21]. Some pharmacological properties of these native medicinal plants [22–24]. Considering the pharmacological properties of these plants, for finding a clear correlation of the pharmacological activities with the hot or cold nature, more detailed studies need to be conducted.

### Conflict of interest statement

We declare that we have no conflict of interest.

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