Kidney failure (CKD) is a debilitating disease that results in severe renal failure. The kidneys are destroyed very slowly and fail. Weakness, lethargy, chronic fatigue, paleness, swelling of the hands and feet, or puffiness around the eyes and high blood pressure are some of the symptoms of kidney failure. The aim of this study was to identify medicinal plants affecting renal failure. In this review study, keywords such as renal failure, renal impairment, hypertension, diabetes, herbs, ethnobotany, ethno-veterinary, ethnopharmacology, and Iran were used. Databases such as ISI, WOS, Scopus, IslamicWorld Science Citation Center, Scientific Index database and Google Scholar were used to review articles and resources. Finally, 23 articles containing ethno-pharmacological information for the treatment of renal failure were used to review the literature. Medicinal plants such as *L. album* L., *O. vulgare* L., *B. vulgaris* L., *E. elaterium*, *C. monogyna*, *P. spina-christi* Miller., *R. ribes* L., *O. europea*, *S. marianum* L., *T. polium* L., *N. sativa* L., *Z. jujuba* (L) H.Karst, *C. bruguieriana* Hand. Mzt., *J. regia* L., *B. Napus* L. and some other herbs are the most important medicinal plants used to treat kidney failure and disorders. Traditional Iranian medicine has long used natural resources to prevent and treat kidney problems. There are various methods available to use herbs to treat diseases. Findings this study can be a comprehensive guide to the ideas and medicinal plants of different regions of Iran that are effective in treating kidney disorders.

Keywords: Kidney, Kidney failure, Ethno-botany, Ethno-veterinary, Medicinal plants, Iran

**Introduction**

Kidney failure means the inability of the kidneys to excrete waste products. The kidneys are normally responsible for clearing the body of waste products, and if they fail, the waste products will accumulate and cause symptoms that vary in severity; Kidney failure can occur in two forms, acute or chronic [1-3]. Kidney failure (CKD) eventually leads to end-stage renal disease and requires one of the alternative treatments,

**Egyptian Journal of Veterinary Sciences**
https://ejvs.journals.ekb.eg/
including transplantation or dialysis [1, 2]. These patients are unable to survive without kidney replacement therapy and are at serious risk of death [3]. One of the most important causes of kidney failure is diabetes and high blood pressure. The number of people with diabetes and high blood pressure is increasing worldwide. As a result, the number of people with kidney disease due to diabetes and high blood pressure, which is associated with high mortality, is also increasing [4,5]. Persistent high blood sugar in prolonged diabetes damages the small blood vessels inside the kidney. Initially, this damage manifests itself in the excretion of protein in the urine. Following high blood pressure, edema and other symptoms of kidney damage appear. Eventually the damage progresses and kidney failure develops [6, 7]. Severe kidney damage leads to sudden deterioration and reduction of kidney function and inability to excrete excess nitrogen products, regulate homeostasis, water and electrolytes, and acidosis [8]. The end result of CKD, regardless of the type of kidney disease, includes progression to kidney failure, its complications and the development of cardiopulmonary disease, and bone problems that cause pain and suffering [9-13]. Its prevalence is 10 to 15% in the United States, 11.2% in Australia, 18.7% in Japan, 10.1% in Singapore and 18.9% in Iran [14-18]. Treatment of renal failure through permanent hemodialysis, in addition to high cost, has many physical and mental problems for the patient [19, 20]. Kidney disorders, including kidney failure, are common problems that cause general damage to the body. People’s interest and approach in the new era includes the use of traditional medicine and herbal medicine, especially herbal medicine. Because herbs have active immune substances that have important medicinal effects on the body and can cure a person’s disease. Today, herbs are used to treat many diseases, including cardiovascular disease (diabetes and/or hypertension) [21-23].

Considering the side effects of chemical drugs on the body and the popularity of people in different cultures in relation to medicinal plants and herbal medicines, therefore, the purpose of this study is to report medicinal plants that can be effective in renal failure disorder.

**Methodology**

Keywords such as renal failure, renal disorders, hypertension, diabetes, herbs and Iran were used to review the articles. Databases such

---

**Fig. 1. The criteria and the number of entry and exit articles**

as WOS, Scopus, Islamic World Science Citation Center, Scientific Index database and Google Scholar were used to search for articles. In this study, 49 articles were searched and found. 4 articles also lacked full text. There were two duplicate articles that were removed. Finally, 45 articles were reviewed for literature review. Of the 45 articles, only 23 articles contained ethnomedicine information (Flowchart).

Results

Based on the results of reviewing Iranian ethnomedicine resource, it was determined that medicinal plants such as as L. album L., O. vulgare, A. sativum L., B. vulgaris L., E. elaterium, C. monogyna, P. spinosa Miller, R. ribes L., O. europea, S. marianum L., T. polium L., N. sativa L., Z. jujuba (L) H.Karst, C. bruguieriana Hand. Mzt., J. regia L., B. Napus L. and some other herbs. Are the important medicinal plants used to treat kidney failure and disorders. The list of plants, families, organs used and the province in question is given in Table 1.

Discussion

Kidney failure occurs due to factors and diseases such as hypertension, diabetes, kidney stones, kidney infection, glomerulonephritis, etc. Medications used to treat kidney failure are usually associated with serious side effects. Therefore, a new approach and strategy for the treatment of renal failure is the use of medicinal plants. Today, natural products obtained from living organisms such as herbs and secondary metabolites are used as one of the most widely used complementary therapies and prevention in the treatment of renal failure [55]. In areas of country (Iran), in the knowledge of traditional medicine, types of herbs are used to remedies pain on the kidney. In Abadeh (Shiraz-southern Iran) A. oreintalis and A. mellifolium herbs are used for cases of kidney pain. In Arasharan of B. vulgaris L. and E. arvense [57], in Ilam (western of Iran) of A. persarum and L. depressum [58], in Khuzestan (southwestern of Iran) of A. haemanthoides and H. orthocarpus [59]. In Sistan of M. neglecta [60], in Moharakeh from P. crispum [61], in Hormozgan of T. terresteris [62] and In Hamedan of C. falcata [63] and in Sistan from M. neglecta, and A. persarum [64] are used in cases of kidney pain. Some herbs in some parts of Iran have an pain killer effect. The results of present study and its comparison with the results of our study, and experienced suggestions of herbal medicine on the renal analgesic effects of herbs, these herbs can have a prophylactic properties on the treatment of renal disorders and insufficiency because some medicinal plants with renal analgesic effect, they have therapeutic effects on renal failure and disorder. Medicinal plants such as Marrubium anisodo, Rosa hemispherica, Hippophae rhamnoides, Viola odorata, Haussknechtia elymaitica, Achillea wilhelmsii, Allium hirtifolium Boiss., Melilotus officinalis(L.), Silybum marianum, Rhus coriaria,Echium amoenum, Equisetum arvense, khorasanicum, Rheum turkestanicum, Rosa beggeriana, Camelia sinensis, Olea europeae, Allium sativum, Crataegus azarolus, Urtica dioica, Crataegus pontica, Rheum ribes, Mentha longifolia and Stachys lavandulfolia are the most widely used herbs effective on blood pressure in Iranian ethnobotanical documents [65]. Problems with the urogenital tract and endocrine glands are common [66-68]. Medicinal plants today are the subject of extensive medical research [69,70] and they can cure diseases because of their therapeutic effects [71-74].

In Iranian ethnotnobotany, medicinal plants such as Urtica dioica L., Teucrium polium L., T. foenum-graecum L. and Juglans regia L. are 111 used to remedy diabetes. Comparison of the results of our study with another study by Asadi 112 Samani et al. (2017) shows that the anti-diabetic plants mentioned in Iranian ethnobotanical 113 studies can have a preventive effect on the treatment of kidney disorders and insufficiency 114 because some medicinal plants have anti-diabetic effects. Therapies are in renal failure and 115 disorder.

Conclusion

This review article found that different Iranian ethnic groups around the world use about forty medicinal plants from 25 herbal medicine families to treat kidney failure. The present study could provide a beacon and new ideas for kidney disorders that lead to the production of effective natural products.

<table>
<thead>
<tr>
<th>Scientific names</th>
<th>family</th>
<th>Organ used</th>
<th>Region used</th>
<th>Bioactive compounds</th>
<th>Chemical formula</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Allium sativum</em> L.</td>
<td>Aliaceae</td>
<td>Root</td>
<td>West Azerbaijan [33]</td>
<td>Allicin</td>
<td>C&lt;sub&gt;6&lt;/sub&gt;H&lt;sub&gt;10&lt;/sub&gt;OS₂</td>
</tr>
<tr>
<td><em>Berberis vulgaris</em> L.</td>
<td>Berberidaceae</td>
<td>Leaf</td>
<td>Arasbaran [34]</td>
<td>Berberine</td>
<td>C&lt;sub&gt;20&lt;/sub&gt;H&lt;sub&gt;22&lt;/sub&gt;NO₆</td>
</tr>
<tr>
<td><em>Erbilium elaterium</em> L.</td>
<td>Cucurbitaceae</td>
<td>Root and fruit</td>
<td>Arasbaran [34]</td>
<td>Kaempferol</td>
<td>C&lt;sub&gt;15&lt;/sub&gt;H&lt;sub&gt;12&lt;/sub&gt;O₇</td>
</tr>
<tr>
<td><em>Cranachus monogyna</em></td>
<td>Rosaceae</td>
<td>Leaves and fruit</td>
<td>Arasbaran [34]</td>
<td>Luteolin</td>
<td>C&lt;sub&gt;15&lt;/sub&gt;H&lt;sub&gt;14&lt;/sub&gt;O₇</td>
</tr>
<tr>
<td><em>Paliurus spinos-christi</em> M.</td>
<td>Rhamnaceae</td>
<td>Fruit</td>
<td>Ilam [35]</td>
<td>Quercetin</td>
<td>C&lt;sub&gt;15&lt;/sub&gt;H&lt;sub&gt;14&lt;/sub&gt;O₇</td>
</tr>
<tr>
<td><em>Rheum ribes</em> L.</td>
<td>Polygonaceae</td>
<td>Stem</td>
<td>Ilam [35]</td>
<td>Sitosterol</td>
<td>C&lt;sub&gt;29&lt;/sub&gt;H&lt;sub&gt;40&lt;/sub&gt;O₁₂</td>
</tr>
<tr>
<td><em>Olea europea</em> L.</td>
<td>Oleaceae</td>
<td>Fruit</td>
<td>North East Persian Gulf [35]</td>
<td>Oleocaprin</td>
<td>C&lt;sub&gt;20&lt;/sub&gt;H&lt;sub&gt;36&lt;/sub&gt;O₁₂</td>
</tr>
<tr>
<td><em>Silybum marianum</em> L. Gaertt</td>
<td>Asteraceae</td>
<td>Root</td>
<td>Khuzestan [37]</td>
<td>Silydianin</td>
<td>C&lt;sub&gt;20&lt;/sub&gt;H&lt;sub&gt;24&lt;/sub&gt;O₁₃</td>
</tr>
<tr>
<td><em>Teucrium polium</em> L.</td>
<td>Lamiaceae</td>
<td>Aerial parts</td>
<td>Khuzestan [37]</td>
<td>Carvacol</td>
<td>C&lt;sub&gt;10&lt;/sub&gt;H&lt;sub&gt;18&lt;/sub&gt;O₃</td>
</tr>
<tr>
<td><em>Tragopogon aureus</em> Boiss.</td>
<td>Asteraceae</td>
<td>Leaf and Fruit</td>
<td>Khuzestan [37]</td>
<td>n-hexadecanoic acid</td>
<td>C&lt;sub&gt;16&lt;/sub&gt;H&lt;sub&gt;32&lt;/sub&gt;O₂</td>
</tr>
<tr>
<td><em>Rubus pulcher</em> L.</td>
<td>Polygonaceae</td>
<td>Root</td>
<td>Khuzestan [37]</td>
<td>Isoleic acid</td>
<td>C&lt;sub&gt;15&lt;/sub&gt;H&lt;sub&gt;22&lt;/sub&gt;O₅</td>
</tr>
<tr>
<td><em>Arctium lappa</em> L.</td>
<td>Asteraceae</td>
<td>Root, leaves</td>
<td>Khuzestan [37]</td>
<td>1,3-cyclo-octadiene</td>
<td>C&lt;sub&gt;10&lt;/sub&gt;H&lt;sub&gt;14&lt;/sub&gt;</td>
</tr>
<tr>
<td><em>Nigella sativa</em> L.</td>
<td>Ranunculaceae</td>
<td>Seed</td>
<td>Sistan [38]</td>
<td>9-ecosyne</td>
<td>C&lt;sub&gt;30&lt;/sub&gt;H&lt;sub&gt;49&lt;/sub&gt;O₅</td>
</tr>
<tr>
<td><em>Suaeda altissima</em> Fall.</td>
<td>Chenopodiaceae</td>
<td>Leaves and stem</td>
<td>Northern region [39]</td>
<td>Alpha-Phinane</td>
<td>C&lt;sub&gt;16&lt;/sub&gt;H&lt;sub&gt;14&lt;/sub&gt;</td>
</tr>
<tr>
<td><em>Silybum marianum</em> L. Gaertt</td>
<td>Asteraceae</td>
<td>Flower</td>
<td>Kazerunon [40]</td>
<td>Silydianin</td>
<td>C&lt;sub&gt;20&lt;/sub&gt;H&lt;sub&gt;24&lt;/sub&gt;O₁₃</td>
</tr>
<tr>
<td><em>Ziziphus jujuba</em> L H.Karst.</td>
<td>Rhamnaceae</td>
<td>Fruit</td>
<td>Mobarake [41]</td>
<td>Jujuboside B</td>
<td>C&lt;sub&gt;20&lt;/sub&gt;H&lt;sub&gt;22&lt;/sub&gt;O₃</td>
</tr>
<tr>
<td><em>Echium amoenum</em> L.</td>
<td>Boraginaceae</td>
<td>Flower</td>
<td>Mobarake [41]</td>
<td>Rosmarinic acid</td>
<td>C&lt;sub&gt;15&lt;/sub&gt;H&lt;sub&gt;14&lt;/sub&gt;O₇</td>
</tr>
<tr>
<td><em>Funaria aestivalis</em> Boiss.</td>
<td>Fumariaceae</td>
<td>Shoot</td>
<td>Marivan [42]</td>
<td>Protopine</td>
<td>C&lt;sub&gt;15&lt;/sub&gt;H&lt;sub&gt;12&lt;/sub&gt;N₃O₅</td>
</tr>
<tr>
<td><em>Rubus conglomeratus</em> Murr.</td>
<td>Polygonaceae</td>
<td>Leaf and stem</td>
<td>Natanz [43]</td>
<td>beta-sitosterol</td>
<td>C&lt;sub&gt;28&lt;/sub&gt;H&lt;sub&gt;40&lt;/sub&gt;O₂</td>
</tr>
<tr>
<td><em>Falcaria vulgaris</em></td>
<td>Apiaceae</td>
<td>Flower and stem</td>
<td>Lorestan [44]</td>
<td>3- Caryophyllene</td>
<td>C&lt;sub&gt;15&lt;/sub&gt;H&lt;sub&gt;14&lt;/sub&gt;</td>
</tr>
<tr>
<td><em>Allium urinaria</em></td>
<td>Asteraceae</td>
<td>Shoot</td>
<td>Lorestan [44]</td>
<td>Thymidine</td>
<td>C&lt;sub&gt;14&lt;/sub&gt;H&lt;sub&gt;9&lt;/sub&gt;N₃O₇</td>
</tr>
</tbody>
</table>
| *Anethum graveolens*        | Apiaceae     | Shoot       | Lorestan [44]             | α-phellandrene               | C<sub>15</sub>H<sub>14</sub>
### TABLE 1.

<table>
<thead>
<tr>
<th>Scientific names</th>
<th>Family</th>
<th>Organ used</th>
<th>Region used</th>
<th>Bioactive compounds</th>
<th>Chemical formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centaurea brongniartiana Hand.Mett.</td>
<td>Asteraceae</td>
<td>Leaf, flower</td>
<td>Fars [43]</td>
<td>9-octadecanoic acid</td>
<td>C_{15}H_{30}O_{2}</td>
</tr>
<tr>
<td>Urtica dioica L.</td>
<td>Urticaceae</td>
<td>Root, aerial parts</td>
<td>Maraveh Tappeh [46]</td>
<td>Hexahydrofarnesyl acetate</td>
<td>C_{16}H_{28}O_{7}</td>
</tr>
<tr>
<td>Cichorium intybus L.</td>
<td>Asteraceae</td>
<td>Whole plant</td>
<td>Kohgiluhi [47]</td>
<td>Sochonide A</td>
<td>C_{16}H_{24}O_{11}</td>
</tr>
<tr>
<td>Hauzaukushia elymatica Boiss.</td>
<td>Apiaceae</td>
<td>Aerial part</td>
<td>Kohgiluhi [47]</td>
<td>trans-asarin</td>
<td>C_{10}H_{20}O_{5}</td>
</tr>
<tr>
<td>Astragalus fasciculifolius Boiss.</td>
<td>Fabaceae</td>
<td>Flower, root, gum</td>
<td>Kohgiluhi [47]</td>
<td>Isoejiofolin</td>
<td>C_{14}H_{26}O_{15}</td>
</tr>
<tr>
<td>Juglans regia L.</td>
<td>Juglandaceae</td>
<td>Leaf, bulb, fruit, root</td>
<td>Sirjan, Kerman province [48]</td>
<td>linoleic acid</td>
<td>C_{18}H_{34}O_{2}</td>
</tr>
<tr>
<td>Matricaria aurea</td>
<td>Asteraceae</td>
<td>Leaf and flower</td>
<td>Sirjan, Kerman province [48]</td>
<td>n-Nonadecane</td>
<td>C_{19}H_{40}O_{2}</td>
</tr>
<tr>
<td>Centaureum tenuifolium</td>
<td>Gentianaceae</td>
<td>Flower</td>
<td>Hormozgan [49]</td>
<td>Alpha-Pinene</td>
<td>C_{10}H_{16}O_{2}</td>
</tr>
<tr>
<td>Salvia mirzayavi Rech.</td>
<td>Lamiaceae</td>
<td>Leaves</td>
<td>Hormozgan [49]</td>
<td>1,8-cineole</td>
<td>C_{10}H_{18}O</td>
</tr>
<tr>
<td>Daphnia botrya (L.)</td>
<td>Amaranthaceae</td>
<td>Aerial parts</td>
<td>Mashhad [50]</td>
<td>Camphor</td>
<td>C_{10}H_{16}O</td>
</tr>
<tr>
<td>Vaccinium arctostaphylos L.</td>
<td>Ericaceae</td>
<td>Fruit</td>
<td>Mashhad [50]</td>
<td>Alpha-Pinene</td>
<td>C_{10}H_{16}O</td>
</tr>
<tr>
<td>Securigera secundaria (L.) Degen &amp; Doefl.</td>
<td>Fabaceae</td>
<td>Seed</td>
<td>Mashhad [50]</td>
<td>Cis-9-Octadecanolic acid</td>
<td>C_{18}H_{34}O_{2}</td>
</tr>
<tr>
<td>Althaea officinalis L.</td>
<td>Malvaceae</td>
<td>Flowers, roots, leaves</td>
<td>Sardasht, Western Azerbaijan province [51]</td>
<td>Isoquinoline</td>
<td>C_{21}H_{20}O_{12}</td>
</tr>
<tr>
<td>Brassica napus L.</td>
<td>Brassicaceae</td>
<td>Root, seed, leaf</td>
<td>Sardasht, Western Azerbaijan province [51]</td>
<td>Isothiocyanate</td>
<td>C_{3}H_{7}N_{5}</td>
</tr>
<tr>
<td>Taraxacum parthenium L..</td>
<td>Asteraceae</td>
<td>Flower</td>
<td>Toisenkan [52]</td>
<td>Camphor</td>
<td>C_{10}H_{16}O</td>
</tr>
<tr>
<td>Allagi pseudallagi</td>
<td>Papilionaceae</td>
<td>Aerial part</td>
<td>Khabir and Rouchoon [53]</td>
<td>Oxygenated sesquiterpenes</td>
<td>C_{15}H_{24}O_{3}</td>
</tr>
<tr>
<td>Medicago sativa L.</td>
<td>Fabaceae</td>
<td>Stem, flower juice</td>
<td>Daha-Iolo, Kerman [54]</td>
<td>Alpha-pinene</td>
<td>C_{10}H_{16}O</td>
</tr>
<tr>
<td>Equisetum arvense L.</td>
<td>Equisetaceae</td>
<td>Whole plant</td>
<td>Zanjan [55]</td>
<td>Kaempferol-3-O-sophoroside</td>
<td>C_{27}H_{36}O_{16}</td>
</tr>
<tr>
<td>Juniperus excelsa L.</td>
<td>Cupressaceae</td>
<td>Aerial part</td>
<td>Kerman [56]</td>
<td>α-pinene</td>
<td>C_{10}H_{16}O</td>
</tr>
</tbody>
</table>

Acknowledgement
To all staff in the department

Conflicts of interest
The authors declared no competing interests.

Funding/Support
None.

References


