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Common treatments with indigenous Iranian plants for routine pediatric diseases and disorders

Abstract. Children, especially newborns, are the most vulnerable human subpopulation. They may develop important and routine disorders and diseases, such as abdominal pain and upset stomach, diarrhea, constipation, headache, fever, skin inflammation, cough, pain, and restlessness. To date, the use of medicinal plants and herbal products in the treatment of diseases in children and infants has not yet been adequately studied. Hence, in the present study, we tried to report medicinal plants used in cultures and traditions of different regions of Iran to treat common diseases of children. The information in this review article was obtained by searching for relevant articles by the keywords ethnobotany, traditional medicine, medicinal plants, pediatrics, neonates, diseases and disorders indexed in databases such as ISI, PubMed, Scopus, Google scholar, and also SID, Magiran as the most important Iranian databases. The articles were screened, and relevant articles were reviewed. Irrelevant articles were excluded. Related articles were reviewed based on the title, abstract and results section of that article. According to Iranian ethnobotanical evidence, medicinal plants such as *Cichorium pumilium*, *Anethum graveolens*, *Amaranthus retroflexus*, *Olea europaea* L., *Ziziphus jujuba*, *Cotoneaster persicus*, *Artemisia annua*, *Alhagi persarum*, *Nigella sativa*, *Astragalus adscondens*, *Adiantum capillus-veneris* L. are among the most promising medicinal plants used in Iranian traditional medicine for treatment of neonatal disorders. Based on the results, the most used herbal family belonged to the *Asteraceae*. Also, the plant organ of the leaf with 31% was the highest organ used in the ethnobotanical knowledge of Iran for common neonatal diseases.

Key words: Ethnobotany, herbs, remedy, pediatric, Iran.

Introduction

One of the most vulnerable (including health issues) groups of human society to which combined attention and support by different community members including families, educators, custodians and other individuals and institutions should be focused at is children, especially newborns [1-3]. If a child gets sick, it is recommended that parents first stay calm. Then, according to the prior knowledge of the signs that are warning, they should examine the condition of the baby and, if necessary, contact the doctor [3; 4]. Some of the warning signs include appetite changes, nagging, lethargy, respiratory problems, itching, neck stiffness, high fever and no wet diapers [5, 6].

Neonatal diseases are not very diverse, however they still remain a serious issue that needs to be carefully considered. They can be acute (severe, but temporary) or chronic (long and recurring) [7-10]. Among the most common and important diseases in

children are sinusitis [11], enuresis [12], colitis [13], jaundice [14], thrush [15], urinary tract infections [16], neonatal sepsis [17], seizures [18] and asthma [19]. That occur in children and should recognize the signs of neonatal danger.

Abdominal pain and upset stomach, diarrhea, constipation, headache, fever, skin inflammation, coughing, pain, restlessness, etc. are among the most important disorders that commonly occur in infants [9; 10]. The fundamentals of traditional medicine, complementary medicine and medicinal plants promise low-cost, widely accessible, friendly to organism beneficial for health solutions. In the era of remarkable advances in science and technology, we may see the comprehensive development in use of simple and indigenous medications as well as plant-based and natural products [11; 12]. Today, a comprehensive approach to traditional medicine and medicinal plants, as well as their scientific and economic applications, especially given the repeated recommendations of the World Health Organization,

is considered a necessity [20; 21]. Various drugs that are used today are originally derived from plant sources, which indicates that some plants may represent proven therapeutic treatments for diseases such as digoxin, calendula, dentol and etc. [17-22]. Many of parents nowadays prefer not to use chemical drugs for their children as much as possible. They tend to use natural and herbal medicines [23; 24]. Medicinal plants can also be administered to children, as with synthetic drugs, through new pharmaceutical formulations, because children will accept them better and will take them more easily [21]. Iranian herbal flora of Iran is rich and is very useful for treating diseases. Thus, in this study, we will briefly point out the most important Iranian plants that are effective in treating common diseases in children.

Main part

The information in this review article was obtained by searching for relevant articles by the keywords *ethnobotany, traditional medicine, medicinal plants, pediatrics, neonates, diseases and disorders* indexed in databases such as *ISI, PubMed, Scopus, SID, Magiran, and Google Scholar*. The articles were screened, and relevant articles were reviewed. Irrelevant articles were excluded.

The search period was from 2000 to 2019. In this study, 44 articles were found. four articles also

lacked full text. There were two duplicate articles that were deleted. Finally, 38 articles were reviewed to review the texts. Finally, only 15 articles contained ethnobotanical information on common disorders and diseases of children.

Based on the results of our search it may be concluded that *Cichorium pumilium, Anethum graveolens, Amaranthus retroflexus, Olea europaea L, Ziziphus jujuba, Cotoneaster persicus, Artemisia annua, Alhagi persarum, Nigella sativa, Astragalus adscendens, Adiantum capillus-Veneris L.* are among the most important medicinal plants used in Iranian traditional medicine for the treatment of neonatal disorders. They are listed in Table 1 in the list of medicinal plants for treating neonatal disorders.

The herbs of this study may have had a therapeutic effect on pediatric diseases due to their phytochemical compounds such as isoadiantol-b, thymoquinone, dillapiole, tocopherol, phytate, quercetin, 1,8-cineole, sphingolipid, eremophilene, a-phellandrene, α -pinene.

The total herbal families used in this study to treat children's diseases were 17 plant families. Based on the results obtained from the analysis, the largest number of medicinal species comes from *Asteraceae* family. Then there are herbal families such as *Rosaceae* and *Lamiaceae*. The results are presented on Figure 1.

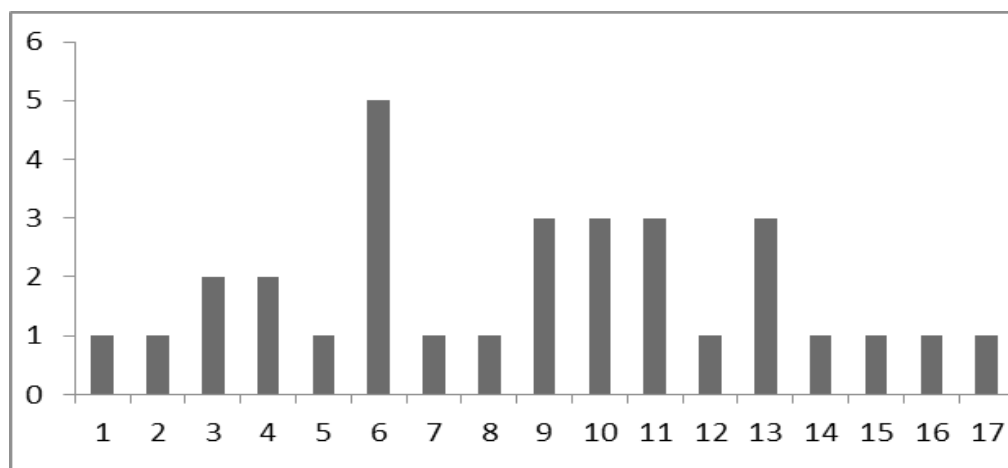


Figure 1 – Ratio of herbal families in the study used to treat children's diseases.

Note: 1- *Adiantaceae*,

2- *Caryophyllaceae*, 3- *Fabaceae*, 4- *Solanaceae*, 5- *Anacardiaceae*, 6- *Asreraceae*, 7- *Poaceae*,
8- *Berberidaceae*, 9- *Rosaceae*, 10- *Rhamnaceae*, 11- *Amaranthaceae*, 12- *Oleaceae*, 13- *Laminaceae*,
14- *Primulaceae*, 15- *Menispermaceae*, 16- *Apiaceae*, 17- *Umbelliferae*

Table 1 – List of Iranian medicinal plants used for the treatment of routine diseases and disorders in infants and children

<i>Scientific name</i>	<i>Herbal family</i>	<i>Plant name</i>	<i>Organ used</i>	<i>Disease/ Disorders(s)</i>	<i>Region</i>	<i>Bio-active compound</i>	<i>Chemical formula</i>
<i>Adiantum capillus-Veneris L.</i>	<i>Adiantaceae</i>	Pare-siavashan	Aerial parts	Jaundice	Behbahan [25]	Isoadiantol-B	$C_6H_{10}O_4$
<i>Nigella sativa L.</i>	<i>Caryophyllaceae</i>	Siahdaneh	Seed	Seizure	Behbahan [25]	Thymoquinone	$C_{10}H_{12}O^2$
<i>Astragalus adscendens</i>	<i>Fabaceae</i>	Gavan	Root	Bloating	Behbahan [25]	α -pinene	$C_{10}H_{16}$
<i>Solanum nigrum L.</i>	<i>Solanaceae</i>	Sag-angour	Aerial parts	Cough	Behbahan [25]	Dillapiole	$C_{12}H_{14}O_4$
<i>Pistacia atlantica</i>	<i>Anacardiaceae</i>	Baneh	Fruit and Leaf	Jaundice	Dashtestan boushehr [26]	Tocopherol	$C_{28}H_{48}O_2$
<i>Artemisia annua</i>	<i>Asteraceae</i>	Dearmaneh	Leaves and shoot	Neonatal ear and diarrhea in children	Erim [27]	Phytate	$C_6H_{18}O_{24}P_6$
<i>Alhagi persarum Boiss.</i>	<i>Fabaceae</i>	Kharsotor	Leaves, stems and flowers	Jaundice	Erim [27]	Quercetin	$C_{15}H_{10}O_7$
<i>Cynodon dactylon</i>	<i>Poaceae</i>	Panjeh-morghhi	Root	Jaundice	Erim [27]	Hexadecanoic acid	$C_{16}H_{32}O_2$
<i>Anthemis cotula L.</i>	<i>Asteraceae</i>	Babounch-bahari	Flowered flower	Children's hearts	East of khuzistan [28]	n-nonadecane	$C_{19}H_{40}$
<i>Berberis vulgaris L.</i>	<i>Berberi-daceae</i>	Zereshk	Fruit	Children's urine burning	East of khuzistan [28]	Berlambine	$C_{20}H_{17}NO_5$
<i>Cotoneaster persicus Pojark.</i>	<i>Rosaceae</i>	Shirkhest	Flowered flower and Leaf	Jaundice	East of khuzistan [28]	1,8-cineole	$C_{10}H_{18}O$
<i>Artemisia scoparia</i>	<i>Asteraceae</i>	Dermaneh-Sarghi	Leaves and flowers	Bloating	North east of the persian gulf [29]	1,8-cineole	$C_{10}H_{18}O$
<i>Ziziphus jujuba</i>	<i>Rhamnaceae</i>	Anab	Fruit	Jaundice	North east of the persian gulf [29]	Maslinic acid	$C_{30}H_{48}O_4$
<i>Artemisia scoparia</i>	<i>Solanaceae</i>	Divkhar-garmsiri	Fruits and leaves and branches	Jaundice	North east of the persian gulf [29]	1,8-cineole	$C_{10}H_{18}O$
<i>Ziziphus jujuba</i>	<i>Amaranthaceae</i>	Taj-khoirous	Leaves and flower and seed	Croupe (laryngotracheobronchitis)	Shirvan [30]	Maslinic acid	$C_{30}H_{48}O_4$
<i>Amaranthus retroflexus L.</i>	<i>Amaranthaceae</i>	Taj-khoirous	Aerial parts	Abdominal pain	Kazeroun [31]	Phytosphingosine	$C_{18}H_{39}NO_3$
<i>Ferula assafoetida</i>	<i>Umbelliferae</i>	Aghsouzeh	Aerial parts	Constipation	Kichag of golistan [32]	Eremophilene	$C_{15}H_{24}$
<i>Olea europaea L.</i>	<i>Oleaceae</i>	Zeytoun	Fruit	Thyroid failure	Mobarakegh-isfahan [33]	Oleuropein	$C_{25}H_{32}O_{13}$
<i>Sorbus torminalis</i>	<i>Rosaceae</i>	Alendri	Fruit	Fever	Heyrat [34]	3ethyl-benzo-thioazoline-6-sulfonic acid	$C_{18}H_{18}N_4O_6S_4$

Продолжение таблицы 1

Scientific name	Herbal family	Plant name	Organ used	Disease/ Disorders(s)	Region	Bio-active compound	Chemical formula
<i>Perovskia abrotanoides</i>	<i>Lamiaceae</i>	Gole-kaboud	Leaf	Fever	Natanz [35]	1,8-Cineole	C ₁₀ H ₁₈ O
<i>Achillea millefolium</i>	<i>Lamiaceae</i>	Boumadaran	Leaf	Abdominal pain	Hezarjerib of mazandaran [36]	1,8-Cineole	C ₁₀ H ₁₈ O
<i>Anagalis arvensis</i> L.	<i>Primulaceae</i>	Gole-nili	Aerial parts	Jaundice	Hormozgan [37]	β-amyryn	C ₃₀ H ₅₀ O
<i>Artemisia scoparia</i>	<i>Asteraceae</i>	Malang	Leaf	Poisoning	Hormozgan [37]	1,8-cineole	C ₁₀ H ₁₈ O
<i>Cocculus pendulus</i>	<i>Menispermaceae</i>	Zomour	Root	Fever	Hormozgan [37]	1,8-cineole	C ₁₀ H ₁₈ O
<i>Anethum graveolens</i>	<i>Apiaceae</i>	Shevid	Leaf and fruit	Abdominal pain	Sirjan [38]	a-Phellandrene	C ₁₀ H ₁₆
<i>Cichorium pumilium</i>	<i>Asteraceae</i>	Kasni-pakotah	Root	Jaundice	Sirjan [38]	Esculetin	C ₉ H ₆ O ₄
<i>Cotoneaster persicus</i>	<i>Rosaceae</i>	Shirkhesht	Fruit	Jaundice	Sirjan [38]	Mannitol	C ₆ H ₁₄ O ₆
<i>Teucrium polium</i> L.	<i>Lamiaceae</i>	Kalpoureh	Air branches	Stomach aches	Joupar kerman [39]	α-pinene	C ₁₀ H ₁₆

Regarding the frequency of the organs used, most often is leaves (31%) presented on figure 2. In this study, the plant parts such as leaf the most used is perhaps the reason for this is that the plant's active ingredients for pharmaceutical. Also, according to ethnobotanical knowledge, another reason has had a medicinal effect during experience, trial and error.

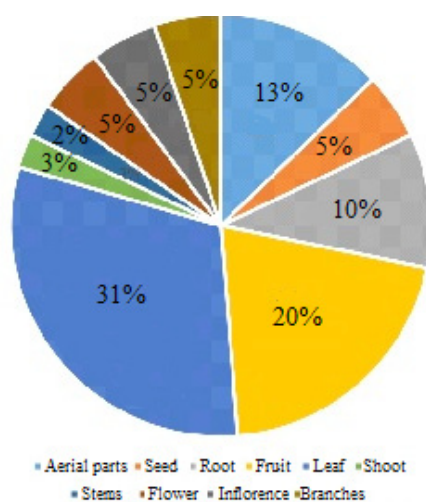


Figure 2 – Parts and organs of plants used in the treatment of children's disorders and diseases

Conclusion

The present study was aimed at analyzing the most important medicinal plants used in traditional medicine in Iran for the treatment of routine disorders in infants and children. These medicinal plants such as *Cichorium pumilium*, *Anethum graveolens*, *Amaranthus retroflexus*, *Olea europaea* L., *Ziziphus jujuba*, *Cotoneaster persicus*, *Artemisia annua*, *Alhagi persarum*, *Nigella sativa*, *Astragalus adscendens*, *Adiantum capillus-veneris* L. A comprehensive approach to traditional medicine and medicinal plants, as well as their scientific and economic applications is considered a necessity. Today, many herbal and complementary medicine experts, especially in Western countries, have divided children into different energy levels [21], and as a result, attach medicinal plants to different groups of children depending on their warmth, coldness, and tonic and degenerative properties [42,43]. The results of the studies show that medicinal plants used in traditional Iranian medicine for the treatment of children's diseases have certain active ingredients such as phenols, flavonoids, anthocynisns, tanans and etc. that can produce antibacterial, anti-inflammatory, and therapeutic effects, [44-46].

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