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Ethnopharmacological importance of local flora in the traditional medicine of Jordan: (A mini review)

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ABSTRACT

Traditional knowledge of medicinal plant use in Jordan is poorly described. During the last years, many phytochemists and botanists from Jordan have conducted qualitative and quantitative several studies, to gather information from the local people in the different rural regions where herbal medicine flourishes. To assess the effectiveness of the specific plants used in the treatment of certain diseases, several ethnopharmacological studies were carried out in different regions of Jordan. The reported use value (UV) and informant's consensus factor (*F*ic) of these studies were analysed and summarised. *Artemisia* and *Achillea* species scored the highest UV (above 0.8). Ajloun area, rich in medicinal plants, showed the highest average UV, followed by the rural area of Badia. Among all reported illnesses dental pain has achieved the highest homogenity of the information (*F*ic 0.97). This ethnopharmacological review revealed that despite the availability of modern medicine in Jordan, traditional medicine is also widely practiced, especially in the rural areas of the country.

Keywords: Ethnopharmacology, Jordan, UV, *Fic*.

INTRODUCTION

The use of herbs in disease treatment existed since very early times of mankind life on earth. Many ancient civilizations: Chinese, Egyptians and Arabs developed rich experience in the treatment of diseases with herbs1-3. In the past few decades, and due to the advanced developments of the synthetic medicine, the herbal medicine was neglected and primarily continued to exist only in the poor segments of the communities4. However, influenced by the "back to nature" trends towards the end of the 20th century and due to the failure of some synthetic medicines in the treatment of chronic as well as serious life threatening diseases botanical extracts and single compounds became increasingly popular. Additionally, the occurrence of side effects evoked the interest into the plant kingdom5.

Jordan, a small country with unique location in Southwest Asia at the junction of the Levantine and the Middle East has a much diversified terrain and nature; the Jordan valley, the Mountain Heights Plateau, and the eastern desert or Badia region, divides Jordan into four major biogeographic zones; namely the Mediterranean, the Irano-Turanean, the Saharo-Arabian, and the Sudanian (Fig. 1). Considering this diversity in geography and climate, the vegetation life is very rich in Jordan. There are 13 different vegetation types, each with many different floral and faunal elements. In this small country, approximately 2500 plant species have been recorded, of which about 20% are listed as medicinal plants while around 100 species (2.5%) are listed as endemic6-8.

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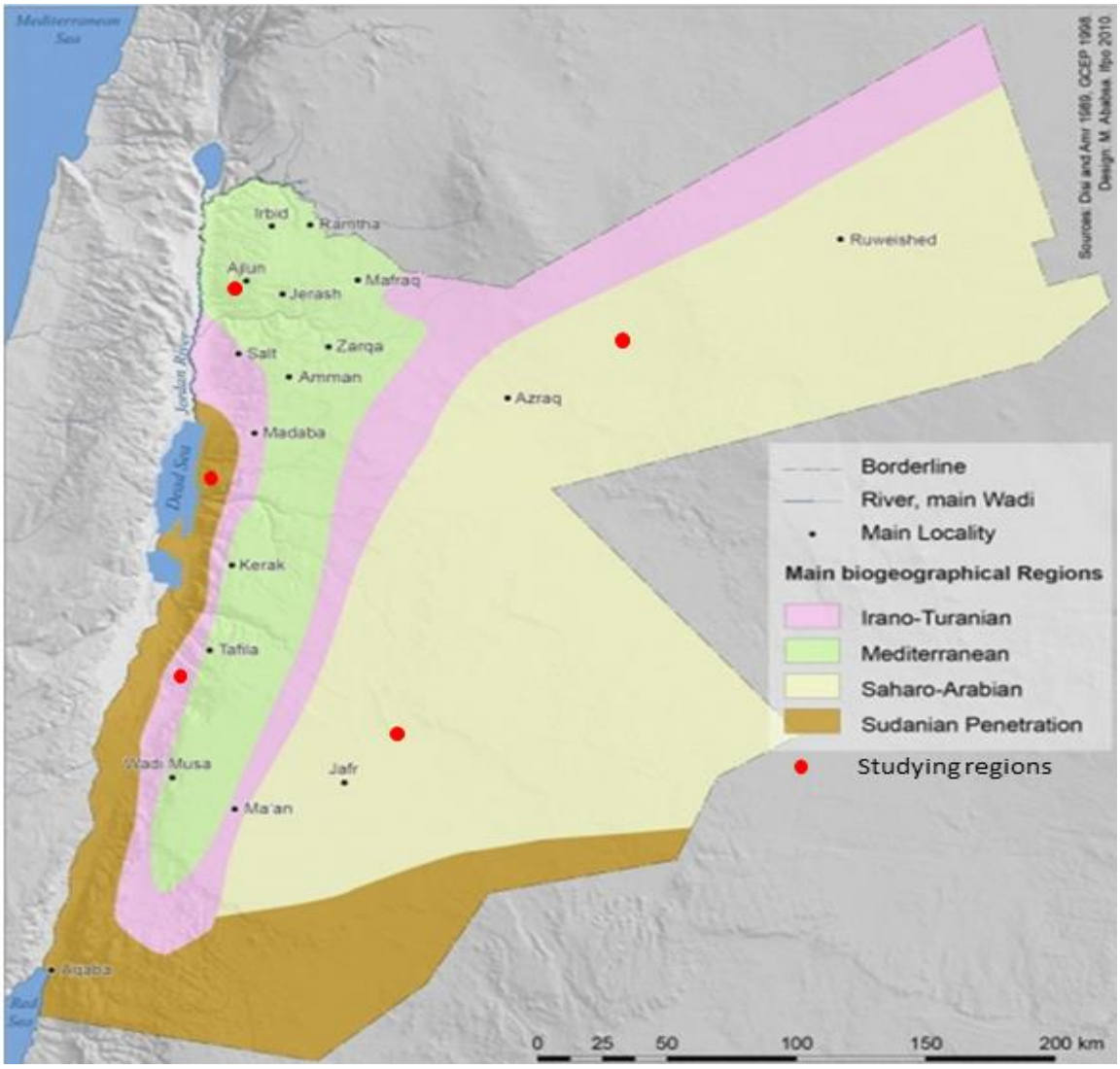

Fig. 1. Jordan map showing the major biogeographic zones and the study regions.

During the last thirty years, many phytochemists and botanists from Jordan have conducted several ethnopharmacological studies, - qualitative and quantitative-, to gather information from the local people in the different regions where herbal medicine still flourishes. The objective of these studies was to build data bank knowledge of the most important medicinal plants in the respective regions9-11. In the present review, systematically, several studies conducted on the traditional use of medicinal plants in Jordan, were reviewed and summarized to assess the importance and effectiveness of the herbal medicine in the different regions of Jordan. Furthermore, the data were analyzed statistically to validate the common medicinal plants and their recommended uses in the studied regions.

Literature review

All the studied surveys were performed through interviews with the local people in these regions.

Interviewers used qualitative tools to gather the information such as informal meetings. Data collected through direct interviews were immediately registered on notebooks. The verification of each plant species, mentioned by the interviewees, was confirmed by professional botanists, using live specimens and photographs. A medicinal use was validated and accepted when at least by three independent practitioners mentioned. Samples of these herbs were collected and kept at the Royal Society for Conservation of Nature (R.S.C.N.). The studies analyzed the data using the following formulas: plant use values (UV) and informant's consensus factor (Fic).

Relative importance of each plant species known locally, and used as herbal remedy, was reported as UV; and calculated as follows:

$UV= \sum U/n$

Where, U is the number of uses per species, n the number of informants. The UV is helpful in determining the plants with the highest use (most frequently indicated) in the treatment of an ailment.

The informant consensus factor (Fic) was employed to assess the homogeneity of the information about a specific plants' use to treat a category of ailments. Fic is calculated using the following formula:

$Fic= (nuc-ns)/(nuc-1)$

Where, nuc is the number of use citations and ns the number of species used for each use citation.

Three studies were conducted on the medicinal herbs in Jordan for Ajloun mountain heights region, Mujib nature reserve, and Northern Badia region6, 7, 10. respectively. Fig. 1 shows the areas where the studies with the local inhabitants are carried out.

The study conducted by Aburjai et al. (2007) identified 46 species of plants growing in Ajloun that are used for the treatment of various diseases6. The most commonly used plants included Achillea falcata, Matricaria aurea, Majorana syriaca, Allium sativum and A. cepa. Moderately unsafe plants were used by practitioners and herbalists rather than by the local inhabitants12, 13. These unsafe plants included Ecballium elaterium, Euphorbia hierosolymitana, Mandragora autumnalis and Citrullus colocynthis. Medicinal plants are used either orally or externally depending on the illness. The oral use of the medicinal plants in form of simple extracts is common mainly to relief stomach ache, back ache, and muscle pain as well as in constipation, cough, asthma, and in the treatment of kidney stones.

A. falcata, M. aurea and M. syriaca were mainly used in the traditional medicine of this region. The external use of medicinal plants in this area are recommended commonly in the management of inflammation and in controlling the irritations of the skin (skin cracks, bruises, scorpion- and insects- bites) and mucous membranes (irritations and infections of the mouth and gums, and hemorrhoids).

Another study, performed by Hudaib et al., (2008) dealt with medicinal plants used in Mujib Nature Reserve and surrounding area7. Results of UV indicated that the highest use value (0.54) was for Artemisia sieberi and Silybum marianum, used in the management of digestive problems and liver diseases, respectively. These two plants are widely known in the herbal medicine of Jordan.

The highest Fic was for digestive problems. The reported plants for these conditions were A. sieberi and M. syriaca as the plants with the most frequent use. The second highest Fic (0.80) was for diabetes, and the plant used was A. sieberi with the highest UV (0.54). The third category addressed respiratory problems (Fic: 0.75), with M. syriaca (UV: 0.46) and M. aurea (UV: 0.40) as the most frequently used species. Female problems of sterility and post-delivery pain were ranked as the fourth ailment category with Fic of 0.72. Arum dioscoridis (UV: 0.37) and Varthemia iphionoides (UV: 0.24) were recommended for these conditions. One important aspect on the ethnopharmacological use of medicinal plants in Mujib area was the use of traditional medicine in the treatment of serious/life threatening diseases like cancer and diabetes.

The reason might be due to the difficult accessibility of modern and advanced medical treatment to the inhabitants of this remote area.

In the third study, medicinal plants used for treatment of different ailments by Northern Badia region habitants, the Bedouins, -were discussed. In this area, medicinal plants were mainly used for the treatment of digestive problems, kidney stones, cough, and asthma. Rarely, but still, serious diseases, like diabetes and heart diseases were also treated using plants from the local flora10.

The highest UVs were obtained for A. herba alba (0.90), followed by A. falcata (0.83), and Teucrium polium (0.80). The former species has a special contribution for the inhabitants' health in Northern Badia. This species is used by the locals for the treatment of multiple conditions such as heart ailments, male sexual weakness, diabetes and for stomach ache. The Beduins use A. falcata for the treatment of stomach ache, fever, and abdominal spasms while T. polium is used to treat stomach problems, colic spasm, inflammations, anorexia and jaundice. Digestive problems achieved the highest Fic (0.8). This finding is in agreement with the two other regional studies by Aburjai et al., (2007) and Hudaib et al., (2008) as well as with the studies from other countries6, 7, 14-16. For controlling digestive ailments like diarrhea Punica granatum and Rhus coriaria were recommended. The most frequently recommended plants, particularly for gastric spasms and stomach ache were A. judaica (UV 0.90), A. falcata (UV 0.83) and T. polium (UV 0.80). The high UV of the latter plants was, however, shared by other ailment categories such as respiratory problems (Fic 0.76), diabetes (Fic 0.75), inflammations and pain (Fic 0.73) and kidney problems (Fic 0.72). A. judaica (UV 0.9), T. polium (UV 0.80), Salvia triloba (UV 0.55), Trigonella foenum-graecum (UV 0.45) and Paronychia argentea (UV 0.33) achieved the highest UV as the very frequently used plants for the management of diabetes.

Kidney problems and inflammations as well as treatment of pain of different etiologies scored high Fic values, 0.72 and 0.73, respectively. Examples of the plants used for the treatment of pain include Commiphora molmol (UV 0.45) and Origanum majorana (UV 0.05) and for the treatment of kidney stones P. argentea.

In another study, carried out in the Badia region in Jordan dental pain (0.97) and gastrointestinal disorders (0.95) scored the highest Fic followed by jaundice (0.85) and renal disorders (0.83)17. There was also a common use of medicinal plants in handling general pain, respiratory disorders, and wounds. As for the gastrointestinal disorders, A. santolina, A. judaica and Mentha longifolia were the most frequently used species. In this study, also the species A. herba alba, A. fragrantissima, Ducrosia flabellifolia, A. judaica and T. capitatum showed high to medium UVs. Most of the species, reported by Nawash et al. (2013) are not only utilized by local Bedouins but are also preferred herbal medicines of the city- and village-inhabitants17. The local Bedouins described the species D. flabellifolia, as the most effective remedy in the treatment of dental pain. The local inhabitants roll the leaves of D. flabellifolia into cigarettes and smoke it, thereby achieving great relief of pain and observing mild sedative effect.

A further study for herbal and traditional medicine use in the region of Showbak in Jordan indicated that the number of plant species recommended traditionally is very limited compared to the occurrence of big variety of medicinal plants in this area18. Interestingly, only few people in this area appear to know about the use of medicinal plants. Most of the locals interviewed in Showbak recommended well-known safe medicinal herbs for treatment purposes. The most commonly recommended and used plant species include Aaronsohnia factorovskyi, A. santolina, Adiantum capillus-veneris, A. herba-alba, Ceratonia siliqua, Clematis recta and Herniaria hirsuta. The herbalists in Showbak recommend also unsafe or toxic plants as Calotropis procera, C. colocynthis, Datura stramonium, Digitalis purpurea and E. elaterium. The use of moderately unsafe plants noted in this region is similar to the herbalists' attitude as reported by Aburjai et

al. (2007) for the practitioners in Ajloun6.

Reported ailment categories in this region include digestive problems and constipation, kidney problems, inflammation and pain, hemorrhoids, blood pressure, skin problems, respiratory problems, diabetes, and delivery and other diseases of the female population. The highest Fic (0.55) was scored for constipation followed by delivery and female problems (Fic 0.48). Lower Fic values were obtained for digestive- and for skin problems with respective Fic values of 0.45 and 0.31.

Still, there are other country studies carried out in surveying the medicinal plants and their uses in Jordan. In an earlier study, listed the commonly used herbs, after interviewing more than 100 herbalists from several regions of Jordan. One hundred and fifty medicinal plant species were recorded in the herbalists' shops. Based on their availability in the market and on the herbalists' recommendations, 26 plant species were considered as commonly used plants5.

These herbs were found in more than 40% of the herbalists' shops; and known to most of the customers. They are known to be safe without adverse effects. The commonly known herbs include Salvia triloba, M. aurea, M. chamomilla, Origanum syriacum, T. polium, A. herba-alba, Cassia senna, Pimpinella anisum, A. fragrantissima, Nigella sativa, Hibiscus sabdariffa, Cuminum cyminum, P. argentea, Zingiber officinale, Cinnamomum zeylanicum, Foeniculum vulgare, Rosmarinus officinalis, Laurus nobilis, T. foenum-graecum, Melilotus italicus, Thymus vulgaris, Zea mays, Ruta graveolens and R. chalepensis, Ricinus communis and Rheum ribes5.

This survey showed that herbal medicine is prescribed by the herbalists symptomatically based on the signs and symptoms alone without understanding the underlying disease5.

Another study was conducted with the same approach but focused on the less commonly used medicinal herbs in Jordan2. This study emphasized on medicinal herbs that are only encountered in a small number herbalists' shops, estimated in less than 40% of these shops. Some of these medicinal herbs are not well known in the country, and documented information on their safety as well as their proper use is lacking.

A recent study conducted by Abdelhalim et al., (2017), investigated the medicinal plants used by the local inhabitants of Tafila area of Jordan19. Approximately, forty-one herbal species were used in Tafila in the traditional treatment of several illnesses. They reported that the Fic values are relatively low in this region which the authors assumed to the low level of shared knowledge on the plants as well as to the limited variety of herbs found in the Tafila region. Nevertheless, the UVs for some species in the Tafila region are comparatively high compared to those recorded in other parts of Jordan. A. cepa and M. aurea achieved the highest UV, while the digestive system complications scored the highest Fic.

2. METHODS

This systematic review was performed by screening published articles dealing with the ethnopharmacological use of the medicinal plants in different regions of Jordan, using Google scholar and PubMed as search engines. The analyzed studies were chosen only, if both, the UV and Fic value were calculated for the different studied plants and ailments. Subsequently the chosen data were organized, statistically analyzed and compared.

Statistical analysis

All the statistical analyses were performed using Statistical Package for Social Sciences (SPSS Inc., Chicago, Illinois) version 22.0 software for Windows.

RESULTS

In this review, the studies on medicinal plants uses' in different regions of Jordan were systematically evaluated. Approximately 200 plants, traditional used, were analyzed covering five different regions of Jordan, namely Ajloun, Badia, Mujib, Showbak and Northern Badia. Ajloun was the

region with widespread use of medicinal plants and scored an average UV of (0.22) as given in Table 1. The plants with the highest UV (above 0.80) were, A. herba-alba A. judaica, A. fragrantissima, A. falcata, C. pepo, and T. polium.

Table 1: The most common plants and herbs used in Ajloun, Badia, NorthernBadia, Showbak and Mujib with their usage values

Plant name	Arabic name	Part used	Region	Usage	UV
Artemisia herba-alba Asson.	Sheeh	Aerial parts	Badia	GIT disorders, respiratory diseases, pain and wounds	0.91
Artemisia judaica L.	Beithran	Foliage	Northern Badia	Calmative, stomachache	0.9
Achillea fragrantissima (Forssk.) Sch. Bip.	Kaisoom	Aerial parts	Badia	GIT and respiratory disturbances	0.85
Achillea falcata L.	Kaisoom	Aerial parts	Northern Badia	Stomachache, fever, antispasmodic	0.83
Cucurbita pepo L.	Karea’	Seeds	Ajloun	Anthelmintic	0.8
Teucrium polium L.	Jeada	Aerial parts	Northern Badia	Stomach and colic spasm, inflammation, anorexia and jaundice	0.8
Achillea santolina L.	JadetSibian	Aerial parts	Badia	GIT disorders	0.69
Crocus hyemalis Boiss.	Za’fran	Stigma filaments	Ajloun	Antitussive, antiasthmatic	0.67
Salvia triloba L.	Meirameih	Foliage	Northern Badia	Stomachache, flatulence, inflammation, diabetes, sexual weakness	0.55
Artemisia sieberii Bess.	Sheih	Foliage	Mujib	Antidiabetic, antispasmodic	0.54
Silybum marianum L.	ShokAljmal, Khurfaish	Flowers and seeds	Mujib	Liver diseases	0.54
Chrozophoraobliqua (Vahl) A.Juss. ex Spreng	Samwa	Roots	Ajloun	Wound healing	0.5
Quercus coccifera L.	Sindyan, Ballot	Fruits and roots	Ajloun	Astringent (mouth gargle)	0.5
Majorana syriaca L.	Zaatar, Mardakoosh	Leaves Seeds	Mujib	Anticough	0.46
Laurus nobilis L.	Laurel, kafur	Leaves	Showbak	Antirheumatic	0.46
Commiphora molmol Engl. Ex	Mormakha	Stem	Northern Badia	Inflammation and pain	0.45
*Coridothymus capitatus*L.Rchb.f.	ZaterFaresy	Leaves	Northern Badia	Heart, respiratory diseases, diabetes and inflammation	0.45
Matricaria aurea Sch.Bip.	Babonej	Leaves and flowers	Northern Badia	Fever, cough, and digestive problems	0.45
Rubia tinctorum L.	Fuwwah or auodalhawa	Roots	Northern Badia	Wound healing and burns	0.45
Trigonella foenum-graecum L.	Hulbah	Seeds	Northern Badia	Diabetes, sexual weakness, stomach, and intestinal pain	0.45
Ducrosia flabellifolia Boiss	Al-Haja	Aerial parts	Badia	General pain and jaundice	0.44
Artemisia judaica L.	Bai’thran	Aerial parts	Badia	GIT disorders	0.43
Hyoscyamus aureus L.	Seikran	Whole plant	Mujib	Toxic (hallucinogenic)	0.4
Matricaria aurea Sch. Bip.	Baboonej	Flowers	Mujib	Antispasmodic, antipyretic	0.4
Ammi visnaga Lam.	Khella	Fruits	Ajloun	Diuretic and bladder stones	0.4

Plant name	Arabic name	Part used	Region	Usage	UV
Rubia tinctorum L.	Fuwwah	Barks and roots	Ajloun	Burns and wounds	0.4
Peganum harmala L.	Harmal	Aerial parts	Badia	GIT, dermatological and general pain	0.4
Teucrium capitatum L.	Jadeh	Aerial parts	Badia	GIT, general pain, woundhealing and diabetes	0.4
Matricaria aurea Sch.Bip.	Babong	Aerial parts	Badia	GIT and respiratory disturbances	0.39
Capsella bursa-pastoris L.	Keisalrai	Whole plant	Ajloun	Diuretic, astringent and hemostatic	0.38
Chrysanthemum cinerariifolium Sch.Bip.	Insect plant	Leaves, flowers	Showbak	Scabies	0.38
Arum dioscoridis Sibth.	Rqeita	Leaves	Mujib	Cancer, post-delivery	0.37
Paronychia argentea Lam.	Rijelelhamame	Aerial Parts	Mujib	Kidney stones, urinary tract	0.37
Peganum harmala L.	Harmal	Seeds and leaves.	Mujib	Increase sexual activity	0.37
Artemisia herba-alba L.	Southern wood	Aerial parts	Showbak	Emmenagogue	0.36
Cichorium intybus L.	Chicory	Whole plant	Showbak	Sedative in typhoid	0.36
Citrullus colocynthis L.	Bitter apple	Fruits, seeds	Showbak	In hepatic and biliary disease	0.36
Malva sylvestris L.	Blue mallow	Aerial parts	Showbak	Antitussive	0.36
Anchusa italica Retz.	Stink herb	Flowers, roots	Showbak	Antidiabetic	0.35
Artemisia judaica L.	Beithran	Flowering tops	Mujib	Antispasmodic, antidiabetic	0.34
Urginea maritima Baker	Gyslan	Bulbs	Mujib	Toxic, arthritis	0.34
Leontice leontopetalum L.	Lion's foot	Corms	Showbak	Antiepileptic	0.34
Althaea offcinalis L.	Khatmia	Leaves	Ajloun	Emollient	0.33
Anchusa strigose M.Bieb.	Himhim	Arial parts	Ajloun	Wounds healing	0.33
Crataegus aronia L.	Zaeroor	Leaves	Ajloun	Kidney stone, diuretic and laxative	0.33
Paronychia argentea Lam.	Rijelalhamame h	Aerial parts	Northern Badia	Renal stones and diabetes	0.33
Artemisia herba-alba Asso	Shaih	Aerial parts and roots	NorthernBadia	Fever and menstrual problems	0.32
Althaea rosea L.	Rose mallow	Leaves	Showbak	Abdominal inflammation and demulcent.	0.32
Melilotus indicus L.	Handaakok	Leaves	Mujib	In cheese preparation	0.31
Teucrium polium L.	Jeada	Aerial parts	Mujib	Spasm, flatulence and diabetes	0.31
Achillea falcata L.	Kaisoom	Aerial parts	Mujib	Carminative	0.31
Euphorbia milii Des Moul.	Halabloob, Luppin	Latex	Mujib	Urticaria and warts	0.3
Cupressus sempervirens L.	Sarou	Fruits and leaves	Northern Badia	Diabetes	0.3
Ephedra campylopoda C.A.	Ephedra	Aerial parts	Showbak	Asthma and bronchodilator	0.3

The plants with UV values higher than 0.39 are represented in Fig. 2. The reported highest UVs for the different regions were as follows: in Mujib; A. sieberi (0.54), in Ajloun; C. pepo (0.80), in Northern Badia; A. judaica (0.90), in Showbak; L. nobilis (0.46), and in Badia; A. herba-alba (0.91).

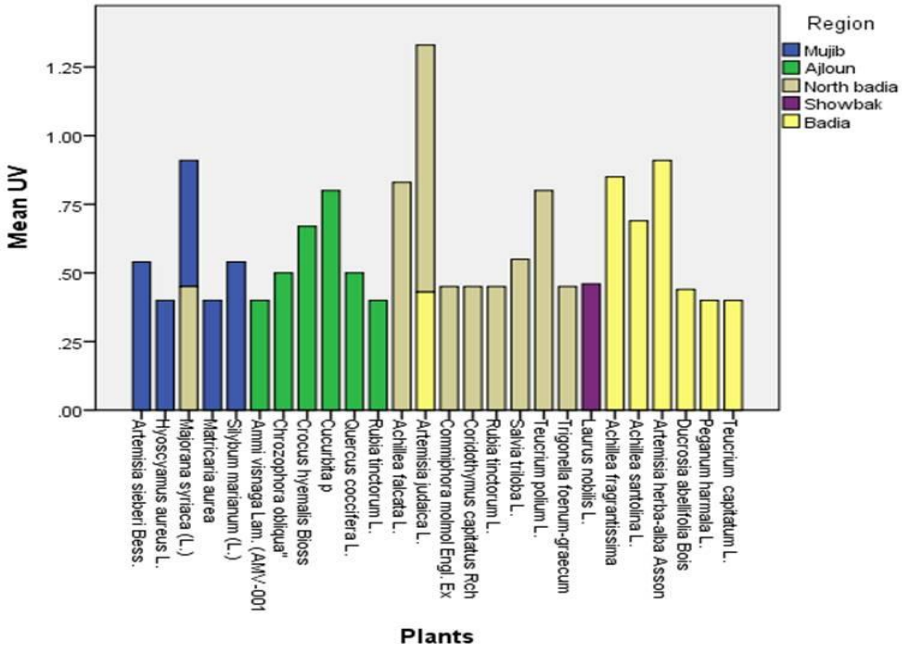

Fig. 2. Mean UV by plant and region.

The evaluated studies revealed that dental pain scored the highest Fic value (0.97) throughout all studied regions, followed by the gastrointestinal disorders with Fic value of (0.95) (Table 2).

Table 2: Informant consensus factor categorized by medicinal use in Ajloun, Badia, Northern Badia, Showbak and Mujib

Region	Ailment category	No. of Species	% of all Species	No. of use citation	% of all use citations	*Fic*
Badia	Dental pain	2	3.6	35	8.1	0.97
Badia	Gastrointestinal disorders	16	28.6	299	69.2	0.95
Mujib	Digestive problems	18	31.58	112	36.6	0.85
Badia	Jaundice	4	7.1	21	4.9	0.85
Badia	Renal problems	3	5.4	13	3	0.83
Mujib	Diabetes	11	19.3	51	16.67	0.8
Ajloun	Digestive problems	18	23.07	88	23.03	0.8
Badia	General pain	15	261	27	6.2	0.77
Northern Badia	Respiratory problems	17	21.79	70	18.32	0.76
Badia	Respiratory disorders	5	8.9	18	4.2	0.76
Mujib	Respiratory problems	10	17.54	37	12.09	0.75
Northern Badia	Diabetes	10	12.82	38	9.94	0.75

Region	Ailment category	No. of Species	% of all Species	No. of use citation	% of all use citations	*Fic*
Northern Badia	Inflammation and pain	27	34.17	48	17.59	0.73
Mujib	Female sterility and delivery problems	6	10.53	19	6.21	0.72
Northern Badia	Kidney problems	14	17.94	48	12.56	0.72
Mujib	Vascular System problems	4	7.02	11	3.59	0.7
Mujib	Skeletal system problems and pain	11	19.3	31	10.13	0.67
Northern Badia	Hypertension	8	10.25	21	5.49	0.65
Mujib	Kidney problems	5	8.77	12	3.92	0.64
Mujib	Liver problems	5	8.77	11	3.59	0.6
Ajloun	Kidney problems	7	15.22	16	11.27	0.6
Badia	Wound healing	5	8.9	11	2.5	0.6
Ajloun	Digestive problems	22	47.83	51	35.92	0.58
Ajloun	Constipation	4	8.7	8	5.63	0.57
Northern Badia	Skin problems	20	25.64	46	12.04	0.57
Showbak	Constipation	4	7.72	9	6.23	0.55
Ajloun	Delivery and female problems	3	6.52	5	3.52	0.5
Northern Badia	Haemorrhoids	3	3.84	5	1.3	0.5
Showbak	Delivery and female problems	3	5.42	7	4.02	0.48
Showbak	Digestive problems	19	44.23	47	32.26	0.45
Northern Badia	Constipation	9	11.53	15	3.92	0.42
Ajloun	Respiratory problems	7	15.22	11	7.75	0.4
Mujib	Skin and scalp problems	9	15.79	14	4.58	0.38
Ajloun	Skin problems	12	26.09	18	12.68	0.35
Northern Badia	Delivery and female problems	3	3.84	4	1.04	0.33
Showbak	Skin problem	11	23.39	16	12.56	0.31
Showbak	Respiratory problems	8	14.12	12	8.79	0.3
Mujib	Cancer	6	10.53	8	2.61	0.29
Showbak	Internal and external Inflammation pain	5	14.13	11	9.46	0.29
Showbak	Urogenital and kidney problems	8	13.2	15	10.7	0.28
Showbak	Diabetic problems	11	20.7	12	8.67	0.27
Showbak	Blood pressure	4	9.75	7	5.76	0.26
Ajloun	Hemorrhoids	4	8.7	5	3.52	0.25
Ajloun	Blood pressure	4	8.7	5	3.52	0.25
Ajloun	Diabetes	10	21.74	13	9.15	0.25
Showbak	Hemorhoids	3	7.78	6	4.65	0.25
Ajloun	Inflammation and pain	8	17.39	10	7.04	0.22

With regard to the highest Fic value, differences were recognized depending on the study area (Table 2, Fig.3). For example, in Northern Badia respiratory problems obtained the highest Fic value (0.76), while in Showbak the highest Fic value was recorded for constipation (0.55). In the remaining regions, treatment of dental pain in Badia (0.97), digestive problems in Mujib (0.85) and Ajloun (0.80) scored the highest Fic values.

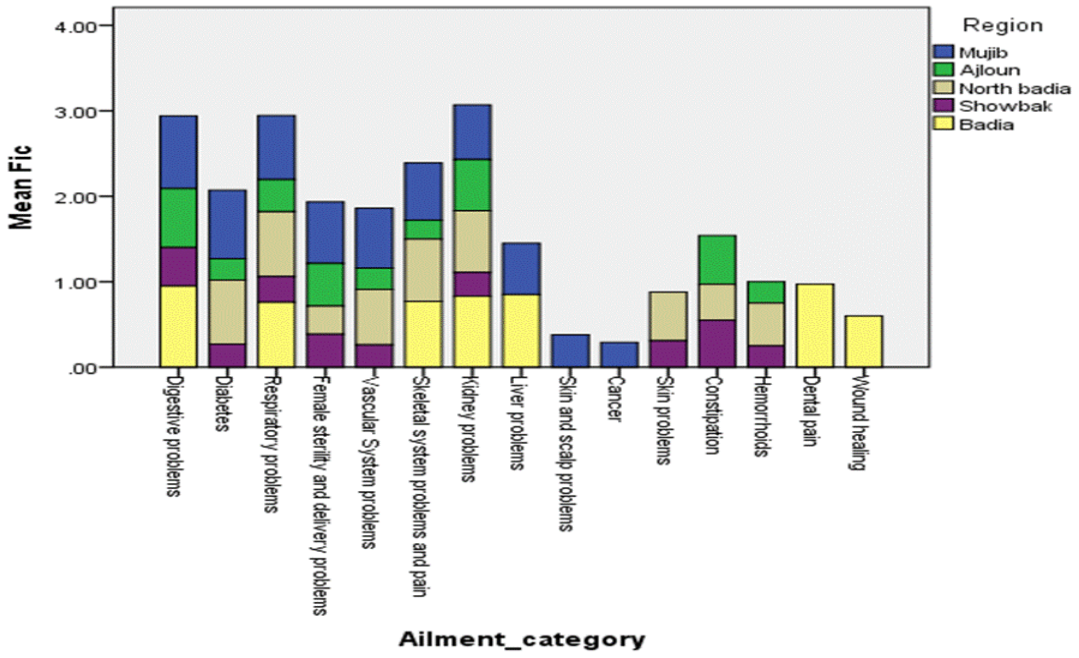

Fig. 3. Mean Fic by ailment category and region.

4. DISCUSSION

Treatment with the medicinal plants in the studied regions has been influenced by several factors 20,21. The main reasons include the availability of the medicinal plants in the region, the accessibility of the inhabitants in each region to modern medical facilities, the culture of the region and its relationship with the heritage of medicinal plants and herbs uses. For Ajloun area, even though the region is not far from the capital Amman, the highest UV average was obtained, which can be explained by the big number of plants available in Ajloun due to the fertile soil and moderate climate.

It is very interesting that dental pain and digestive problems have the highest Fic values among the studied regions, which indicate the fact that these ailments are common and the local people have the knowledge to treat them using the plants by avoiding the invasive and costly procedures used by the dentists.

5. CONCLUSIONS

In conclusion, still in the 21st century, traditional medicine is very popular in Jordan, especially among the rural inhabitants as well as in the regions with rich flora.

Conflict of interest

The authors declare they have no conflict of interest concerning the work reported here.

REFERENCES

1. Schultes R.E., Medicinal plants of North Africa. *J Ethnopharmacol*. 1984;3(10):334. doi:10.1016/0378-8741(84)90028-x
2. Afifi F.U., Abu-Irmaileh B., Herbal medicine in Jordan with special emphasis on less commonly used medicinal herbs. *J Ethnopharmacol*. 2000;(1-2(72):101-110. doi:10.1016/S0378-8741(00)00215-4
3. Rotblatt M., Herbal Medicine: Expanded Commission E Monographs. *Ann Intern Med*. 2000;133(6):487. doi:10.7326/0003-4819-133-6-200009190-00031
4. Saad B., Azaizeh H., Said O., Tradition and perspectives of Arab herbal medicine: A review. *Evidence-based Complement Altern Med*. Published online 2005:2(4): 475–479. doi:10.1093/ecam/neh133
5. Abu-Irmaileh B.E., Afifi F.U., Herbal medicine in Jordan with special emphasis on commonly used herbs. *J Ethnopharmacol*. 2003;2-3(89):193-197. doi:10.1016/S0378-8741(03)00283-6
6. Aburjai T., Hudaib M., Tayyem R., Yousef M., Qishawi M., Ethnopharmacological survey of medicinal herbs in Jordan, the Ajloun Heights region. *J Ethnopharmacol*. 2007;110(2):294-304. doi:10.1016/j.jep.2006.09.031
7. Hudaib M., Mohammad M., Bustanji Y., Ethnopharmacological survey of medicinal plants in Jordan, Mujib Nature Reserve and surrounding area. *J Ethnopharmacol*. 2008;120(1):63-71. doi:10.1016/j.jep.2008.07.031
8. Darwish R.M., Aburjai T.A., Effect of ethnomedicinal plants used in folklore medicine in Jordan as antibiotic resistant inhibitors on Escherichia coli. *BMC Complement Altern Med*. 2010;10:9. doi:10.1186/1472-6882-10-9
9. Al-Qura'n S., Ethnobotanical survey of folk toxic plants in southern part of Jordan. *Toxicon*. Published online 2005:46(2):119-29. doi:10.1016/j.toxicon.2005.04.010
10. Alzweiri M., Sarhan A., Mansi K., Hudaib M., Aburjai T., Ethnopharmacological survey of medicinal herbs in Jordan, the Northern Badia region. *J Ethnopharmacol*. 2011;1(137):27-35. doi:10.1016/j.jep.2011.02.007
11. Sawsan A.O., Dawud MA-E., Medicinal plants in the high mountains of northern Jordan. *Int J Biodivers Conserv*. 2014;6():(6):436-443. doi:10.5897/ijbc2014.0713
12. Alkofahi A., Atta A.H., Pharmacological screening of the anti-ulcerogenic effects of some Jordanian medicinal plants in rats. *J Ethnopharmacol*. 1999;67(3):341-345. doi:10.1016/S0378-8741(98)00126-3
13. Yusuf S., Agunu A., Diana M., The effect of Aloe vera A. Berger (Liliaceae) on gastric acid secretion and acute gastric mucosal injury in rats. *J Ethnopharmacol*. 2004;93()(1):33-37. doi:10.1016/j.jep.2004.03.027
14. Andrade-Cetto A., Ethnobotanical study of the medicinal plants from Tlanchinol, Hidalgo, México. *J Ethnopharmacol*. 2009;122 (1):163-171. doi:10.1016/j.jep.2008.12.008
15. Gazzaneo L.R.S., Paiva de Lucena R.F., de Albuquerque U.P., Knowledge and use of medicinal plants by local specialists in an region of Atlantic Forest in the state of Pernambuco (Northeastern Brazil). *J Ethnobiol Ethnomed*. 2005;1(1)::9. doi:10.1186/1746-4269-1-9
16. Uprety Y., Asselin H., Boon E.K., Yadav S., Shrestha K.K., Indigenous use and bio-efficacy of medicinal plants in the Rasuwa District, Central Nepal. *J Ethnobiol Ethnomed*. 2010;6(1):):3. doi:10.1186/1746-4269-6-3
17. Nawash O., Shudiefat M., Al-Tabini R., Al-Khalidi K., Ethnobotanical study of medicinal plants commonly used by local bedouins in the badia region of Jordan. *J Ethnopharmacol*. 2013;148()(3):921-925. doi:10.1016/j.jep.2013.05.044
18. Al-Qura'n S., Ethnopharmacological survey of wild medicinal plants in Showbak, Jordan. *J Ethnopharmacol*. 2009; 1(123): 45-50. doi:10.1016/j.jep.2009.02.031
19. Abdelhalim A., Aburjai T., Hanrahan J., Abdel-Halim H., Medicinal plants used by traditional healers in Jordan, the Tafila region. *Pharmacogn Mag*. Published

online 2017:S95–S101. doi:10.4103/0973-1296.203975

20. Shadid, K.A., Al-lahham, S., Jaradat, N.A., Abu-Nameh, E.S., & Qaisi, A.M. Preliminary Phytochemical Screening, Antioxidant and Antimicrobial Activities of the Aqueous, Methanol, Acetone, and Hexane Fractions of Centaurea cyanoides Wahlenb. *Jordan Journal of Pharmaceutical Sciences*, **(**2019**)** 12.
21. Kattuoa, M.L., Issa, R., & Beitawi, S. Commonly used herbal remedies for the treatment of Primary Dysmenorrhea and Heavy Menstrual Bleeding by herbalists in Amman, Jordan: A cross-sectional survey. *Jordan Journal of pharmaceutical sciences*. (2020); 4 (13) 467- 483.

أهمية النباتات المحلية في الطب التقليدي الأردني: مراجعة مصغرة

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ملخص

وصفت المعرفة التقليدية لاستخدام النباتات الطبية في الأردن بشكل قليل نسبيا خلال السنوات الماضية ، أجرى العديد من علماء الكيمياء النباتية وعلماء النبات من الأردن العديد من الدراسات النوعية والكمية ، لجمع المعلومات من السكان المحليين في المناطق الريفية المختلفة حيث يزدهر طب الأعشاب، وذلك لتقييم فعالية النباتات المحددة المستخدمة في علاج بعض الأمراض ، تم إجراء العديد من الدراسات الإثنوغرافية في مناطق مختلفة من الأردن، وتم تحليل وتلخيص قيمة الاستخدام المبلغ عنها (UV) وعامل إجماع المخبر (Fic) لهذه الدراسات. سجلت أنواع الأرطماسيا والأخيلية أعلى درجات الأشعة فوق البنفسجية (فوق 0.8). وسجلت منطقة عجلون الغنية بالنباتات الطبية أعلى متوسط للأشعة فوق البنفسجية تليها منطقة البادية الريفية. من بين جميع الأمراض المبلغ عنها ، حقق ألم الأسنان أعلى تجانس للمعلومات (Fic 0.97)). كشفت هذه المراجعة الإثنوغرافية الدوائية أنه على الرغم من توافر الطب الحديث في الأردن ، فإن الطب التقليدي يمارس أيضًا على نطاق واسع ، لا سيما في المناطق الريفية من البلاد.

الكلمات الدالة: علم الأدوية الإثني ، الأردن، قيمة الاستخدام المبلغ عنها (UV) وعامل إجماع (Fic).

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