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Medicinal Plant Diversity in the Flora of Gaza Valley, Gaza Strip, Palestine

تنوع النباتات الطبية في فلورا منطقة وادي غزة- قطاع غزة- فلسطين

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Abstract

An extensive survey on medicinal plant diversity in the flora of Gaza Valley, a preserved natural area, was carried out during the years 2008-2009. This is the first time that one location of the Gaza Strip has been the subject of medicinal plant investigation. The current survey revealed that 52 plant species are medicinal, distributed in 48 genera, belonging to 33 families that have medicinal uses. These families are represented in the flora with 183 species. The Compositae and Euphorbiaceae families have the highest number (5) of medicinal plants among both of them. Solanaceae is represented with 3 medicinal plant species. Remaining 30 families were represented by 39 medicinal plant species, each family was represented by one or two species. An enumeration of these 52 medicinal plant species is presented with the current scientific nomenclature, Vernacular names, medicinal properties and uses. The objective of this study is to emphasize the importance of conservation of the biocultural data about various medicinal plants of Palestine.

Key words: Conservation, Diversity, Medicinal Plants, Flora, Gaza, Palestine

ملخص

تم في هذا البحث لأول مرة مسح شامل لتنوع النباتات الطبية في فلورا المحمية الطبيعية وادي غزة خلال عامي ٢٠٠٨-٢٠٠٩. يوجد في الفلورا ٥٢ نوعا تنتمي إلى ٤٨ جنسا و٣٣ عائلة نباتية لها استخدامات طبية. مجموع الأنواع النباتية التي تنتمي لهذه العوائل هو ١٨٣ نوعا. تمتلك العائلة المركبة (Compositae) والعائلة اللبينية (Euphorbiaceae) أعلى رقم (٥) من النباتات الطبية, يليهما العائلة الباذنجانية (Solanaceae) التي تمثل بثلاثة نباتات طبية. أما التمثيل ل ٣٠ عائلة المتبقية فهو ٣٩ نوعا طبيا، إذ تمثل كل عائلة منها بنوع أو نوعين. لقد تم تعداد هذه ال ٥٢ نوعا طبيا مع ذكر الأسماء اللاتينية الحديثة لها كذلك الأسماء العربية لها مع ذكر خواصها الطبية واستعمالاتها. هذا البحث يهدف إلى التركيز على أهمية المحافظة على النباتات الطبية المتنوعة في فلسطين.

Introduction

During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of the world (Lev 2006; Gazzaneo et al., 2005; Al-Qura'n 2005; Hanazaki et al., 2000; Rossato et al., 1999). The use of medicinal plants has always been a part of human heritage, over the centuries, every population has developed its knowledge in recognizing harvesting, and using plants to cure infirmities (Vincenzo 2002).

Today, according to the World Health Organization (WHO), as many as 80% of the world's people depend on traditional medicine for their primary healthcare needs (Muthu et al., 2006). There are considerable economic benefits in the development of indigenous medicines and in the use of medicinal plants for the treatment of various diseases (Azaizeh et al., 2003). Due to poverty, ignorance and unavailability of modern health facilities, most people especially rural people are still forced to practice traditional medicines for their common day ailments. Most of these people form the poorest link in the trade of medicinal plants (Khan 2002).

The use of traditional medicine in the 20th century, particularly herbal medicine, was widespread throughout the Middle East, including Palestine (Bailey and Danin 1981; Palevitch and Yaniv 2000).

In Palestine, particularly in the West Bank a lot of ethnobotanical and ethnomedicinal studies have been carried out to distinguish the importance of medicinal plants. In addition, herbal medicine is used to treat various disease, including gastrointestinal diseases, urinary tract infections, infertility, and cutaneous abscesses (Roweha 1983).

A preliminary classification of the healing potential of medicinal plants based on an ethopharmacological survey conducted among 27 Bedouin informants living in the Negev desert region showed that there were 81 species used for treating 115 different ailments and diseases (Friedman et al., 1986). A recent ethnopharmacological survey carried out among 102 informants living in the West Bank revealed that there were at least 63 reliable plant species still in use for treating skin, urinary system, gastric system, prostate diseases as well as cancer and other ailments (Ali-Shtayeh et al., 2000), while our knowledge on Gaza Strip medicinal plants is still very restricted. A comparative food ethnobotanical study was carried out in fifteen local communities distributed in Northen West Bank. The study recorded 100 wild edible plant species, distributed across 70 genera and 26 families (Ali- Shtayeh et al., 2008). The previous study mentioned that the most significant species include *Majorana syriaca, Foenculum vulgare, Malva sylvestris, Salvia fruticosa, Cyclamen persicum, Micromeria fruticosa, Arum palaestinum, Trigonella foenum-graecum, Gundelia tournefortii, and Marticaria aurea,* all the ten species with the highest mean of cultural importance values, were cited in all five areas. A common cultural background may explain these similarities. One taxon (*Majorana syriaca*) in particular was found to be among the most quoted species in almost all surveyed areas.

An ethnobotanical survey was carried out in the West Bank to evaluate the relative efficacy of the plants used to treat skin diseases and prostate cancer, of about 165 plant species mentioned by the informants, 63 (38.1%) were mentioned by three or more informants. Twenty one of these plants were reported to relieve skin diseases, 17 for urinary system disorders, 16 for gastric disorders, 9 for cancer and prostate, 8 for arthritis, 5 for respiratory problems and 5 for other ailments. The

following plant species were classified as popular in this study: *Teucrium polium, Matricaria aurea, Urtica pilulifera, Paronychia argenta, Petroselinum sativum,* and *Salvia fruticosa*. The remaining 57 species were classified as unpopular (Ali-shtayeh et al., 2000). ARIJ (2002) described the wild and agriculture plants occurring in Palestine with their nutritional, economic, medicinal and fodder values. Antibacterial activity of organic and aqueous extracts of 15 Palestinian medicinal plants against eight different species of bacteria, was studied by Essawi and Srour (2000).

In the Gaza Strip, our knowledge of floristic composition, ethnobotanical studies and particularly medicinal plant studies is very scanty compared to the West Bank of Palestine (Abd Rabou et al., 2008; Abou Auda et al., 2009; Boulos 1959). Therefore, this present study was designed to record valuable information regarding multifarious medicinal uses of native plant species. This investigation will serve as the first baseline information for carrying out detailed studies on the medicinal flora of the Gaza Strip in the future.

Materials and Methods

The present study, as a part of the analysis of the medicinal plant diversity in the flora of the Gaza Strip, Palestine, was undertaken in the area of Gaza Valley, which has been considered the only preserved natural area in the Gaza Strip, based on a decision of the national Palestinian Authority some years ago. Field visits were made during the flowering period of the years 2008-2009. Plant specimens were collected randomly. For herbaceous species, whole plants were collected and for trees and shrubs, stems with leaves and reproductive structures were collected. Specimens were cleaned of adhering soil/dust in the field by shaking and quick rinsing with tap water. Plants were placed in paper bags and transferred to the laboratory. Any remaining particles of soil were removed by use of pressurized airflow and by the use of a paint brush in some cases, by quick rinsing with distilled water. All plant specimens were photographed as well as collected in the field and later brought to the Biology Department, Faculty of Science, Al-Aqsa

University for complete identification. Different methods of plant identification such as taxonomic keys, written description, specimen and image comparison were used.

The collected plant specimens were pressed, dried and finally preparing a mounted herbarium specimen by gluing the plants and a label (listing the field data) to a sheet of standard herbarium paper (Simpson 2006). The plant specimens were identified with the help of floristic literature (Täckholm 1974; Zohary 1966 and 1972; Dothan 1978 a and b and 1986 a and b; Boulos 1999, 2000 and 2002; Danin 2000 and 2004). The specimens are deposited, as first voucher specimens, and maintained in the under establishment primitive herbarium of Al-Aqsa university in order to be accessible for our study. After plant identification, relevant literature was surveyed and the recognition of the medicinal plant was achieved. Finally, an enumeration of all medicinal species is given with botanical name, common Arabic names and medicinal properties and uses according to relevant literature.

Results and Discussion

The floristic survey of the study area showed that a total of 183 species under 33 families are represented in the flora. The investigation for medicinal plant diversity within these families revealed that out of these 183 species, 52 are medicinal and many of them are mentioned at different literature. The distribution of these taxa is summarized in Table 1.

An enumeration of these 52 medicinal species is given below, arranged alphabetically under their respective families, with botanical names, common Arabic names, medicinal properties and uses according to relevant literature.

Checklist of the medicinal plants:

1- Compositae

a- *Chrysanthemum coronarium* L.; Pasoom, Khewan

Medicinal properties and uses: treating digestive system, tooth, respiratory system, kidney, urinary system, nervous system, muscular system, organ Britain system, rheumatism, skin diseases and hair diseases (Ali-Shtayeh and Jamous 2008). Inflorescence could be used as herbal tea (Ali-Shtayeh et al., 2008).

b- *Cichorium endivia* L.; Seraes, Aleek

Medicinal properties and uses: whole plant poisoning, leaves are used for bacterial infection and rheumatism (Said et al., 2002). Leaves are boiled and eaten as salad with yoghurt (Ali-Shtayeh et al., 2008).

c- *Matricaria aurea* (Loefl) Sch. Bip.; Papounaj dahabi

Medicinal properties and uses: Leaf and flower are used for treating fever, coughing and heart diseases (Said et al., 2002). Inflorescence is used as a herbal tea. Seasoning, foliage added to tea as a condiment (Ali-Shtayeh et al., 2008).

d- *Scolymus hispanicus* L.; Sinaria mouamira

Medicinal properties and uses: Used for treating stomachache, diuretic and ulcer (Ugurlu and Secmen 2008).

e- *Silybum marianum* (L.) Gaertn; Shouk al gazal, korfeesh aljemal

Medicinal properties and uses: Flower and seed are used for liver diseases, poisoning infertility and sexual weakness (Said et al., 2002). Food for camels (Abd Rabou et al., 2008). Used as vegetable, stem and seeds cooked as soup, eaten raw (Ali-Shtayeh et al., 2008).

2- Euphorbiaceae

a- *Chrozophora tinctoria* L. Raf.; Abad el shams al nili

Medicinal properties and uses: Used for treating skin diseases (wart), eaten as fruits (Anonym 2000; Guner et al., 2000; Honda et al., 1996).

b- *Ephorbia peplis* L.; Helpita

Medicinal properties and uses: Irritant and poisonous. Used for treating the lowering of blood pressure (Mossa et al., 2000).

c- *Ephorbia terracina* L.; Lapine

Medicinal properties and uses: The plant is used as a remedy for treating fever and paralysis (Al-Shanwani 1996).

d- *Mercurialis annua* L.; Helpoup

Medicinal properties and uses: Used for treating diabetes, cancer and skin diseases (Said et al., 2002).

e- *Ricinus communis* L.; Karwaa

Medicinal properties and uses: Seeds are used for laxative, hair loss and skin diseases (Said et al., 2002; Muthu et al., 2006). Used for treatment of scrofulous sores, boils and rheumatic swellings (Mossa et al., 2000). Economically, the plant is used in shampoo and soap industry (Abd Rabou 2008). Other possible uses for fuel and oil production (Amer 2002).

3- Solanaceae

a- *Datura innoxia* Mill; Datwra, Pougoum

Medicinal properties and uses: Intoxicant, toxic and poisonous. The plant is used for its poisonous properties in the preparation of drugs (Mossa et al., 2000; Chopra et al., 1958; Watt 1962; Everist 1974).

b- *Lycopersicon esculentum* Mill; Pandoura, Tamatem

Medicinal properties and uses: Fruit is edible and medicinally used for treating digestive system, heart, artery, blood, skin, hair, wounds, burns, stinging and psoriatic (Ali-Shtayeh and Jamous 2008).

c- *Solanum nigrum* L.; Anip aldeep

Medicinal properties and uses: Foliage is used for treating skin diseases (Said et al., 2002).

4- Amaranthaceae

a- *Amaranthus spinosus* L.; Ourf aldeek alshouki

Medicinal properties and uses: Antipyretic, diuretic, laxative, stomachic. The root extract is given in gonorrhoea. The boiled roots and leaves are given to children as a alaxative and also given in constipation and jaundice diuretic (Chopra et al., 1958; Yusuf et al., 1994).

b- *Amaranthus viridis* L.; Katifa haefaa

Medicinal properties and uses: Antipyretic, alexiteric, emollient, expectorant, laxative, stomachic. The plant is used to improve the appetite. More, it is useful in leucorrhoea and leprosy (Chopra et al., 1958 ; Yusuf et al., 1994).

5- Caryophyllaceae

a- Herniaria hirsuta L.; Eish alshouwla

Medicinal properties and uses: Used for treating prostate disorders and urine intermittence and digestive system (Ali-Shtayeh et al., 2000).

b- *Paronychia argentea* Lam.; Rejel Alhamama

Medicinal properties and uses: Leaf and flower are used for treating stones in kidney, diabetes and heart diseases (Said et al., 2002). Foliage is cooked as pastry or eaten raw (Ali-Shtayeh et al., 2008).

6- Chenopodiaceae

a- *Atriplex halimus* L.; Katif pahri

Medicinal properties and uses: Leaves are used for heart diseases, diabetes and rheumatism (Said et al., 2002). The plant seems to be a soil binder, it stops further erosion when it grows on hillsides and high cliffs facing the sea. Moreover, it protects the coastal farms from the adverse impacts of sea winds (Abd Rabou et al., 2008).

b- *Beta vulgaris* L.; Salek

Medicinal properties and uses: Used for treating heart, blood, arteries and cancer (Ali-Shtayeh and Jamous 2008).

***7*- Cruciferae**

a- *Capsella bursa-pastoris* (L.) Medik; Kees el raee

Medicinal properties and uses: Used for digestive system, heart, blood and arteries (Ali-Shtayeh and Jamous 2008). Used as vegetables, leaves eaten raw with bread (Ali-Shtayeh et al., 2008).

b- *Eruca sativa* Mill.; Rawk

Medicinal properties and uses: Leaves are used for treating sexual weakness, seeds are used for sexual weakness, skin diseases and hair loss (Said et al., 2002). Used as vegetables, foliage eaten raw as salad (Ali-Shtayeh et al., 2008).

8- Liliaceae

a- *Asparagus horridus* L.; Shoueet, Hlaioun

Medicinal properties and uses: Used for treating kidney and urinary system (Ali-Shtayeh and Jamous 2008).

b- *Urginea maritima* (L.) Baker; Pasoul, Ansalan

Medicinal properties and uses: Juice extracted from bulb is used externally for skin diseases (Said et al., 2002).

9- Mimosaceae

a- *Acacia farnesiana* Willd; Sant, Al-fetna

Medicinal properties and uses: Used for treating rheumatism, skin, digestive system, prostate disorders, diabetes and respiratory system (Ali-Shtayeh et al., 2000). The plant can be used for shade and wind breaks (Amer 2002).

b- *Prosopis farcta* (Banks & Sol.) J.F. Macbr*;* Gianpout

Medicinal properties and uses: Used for treating prostate disorders and interrupting the urine (Ali-Shtayeh and Jamous 2008).

10- Moraceae

a- *Ficus carica* L.; Alteen

Medicinal properties and uses: Fruit is edible and medicinally used for treating urinary system, nervous system, digestive system, respiratory system, gall bladder stones, mouth ulcers, skin diseases, hair diseases and stinging (Ali-Shtayeh and Jamous 2008).

b- *Ficus sycomorus* L.; Aljoumez

Medicinal properties and uses: Stem is used for treating skin diseases, milky sap is used externally until the condition improves and digestive system (Said et al., 2002). Seasoning, foliage dried and added to cake as a condiment, eaten raw or cooked as soup (Ali-Shtayeh et al., 2008). Dry branches of the species are collected for fuel purposes (Abd Rabou et al., 2008).

11- **Polygonaceae**

a- Polygonum equisetiforme Sm.; Algoudap

Medicinal properties and uses: Root is used for treating kidney diseases (Said et al., 2002).

b- *Rumex pictus* Forssk; Hamasees, Foustek el eshra

Medicinal properties and uses: Sedative, spasmogenic and antimicrobial (Mossa et al., 2000).

12- **Urticaceae**

a- *Urtica pilulifera* L.; Kourees najaj

Medicinal properties and uses: Foliage is used for treating cancer, stomach, intestine pain, inflammation, liver diseases and circulatory system (Said et al., 2002). Leaves can be used as herbal tea. Stem is eaten raw as salad (Ali-Shtayeh et al., 2008).

b- *Urtica urens L.*; Kourees adi

Medicinal properties and uses: Foliage used for treating cancer, stomach, intestine pain, inflammation and liver diseases (Said et al., 2002).

13- **Apocynaceae**

a- *Nerium oleander* L.; Aldefla

Medicinal properties and uses: foliage is used for treating skin diseases, diuretic, poisonous.The roots and leaves are used in skin diseases (Chopra et al., 1958; Yusuf et al., 1994).

14- Cactaceae

a- *Opuntia ficus-indica* (L.) Mill; Alteen alshowki

Medicinal properties and uses: Used for skin diseases (Ali-Shtayeh et al., 2000). Plant fruit is usually harvested for food. The young stems could be eaten by people after being cleared from spines. Domestic animals such as camels may also graze on plant stems (Abd Rabou et al., 2008).

15- Cupressaceae

a- *Cupressus sempervirens* L.; Serou

Medicinal properties and uses: Fruit is used for diabetes and nervous system (Said et al., 2002). It is usually found bordering agriculture fields on orchards in both sites of Wadi Gaza. The species was and still under actual threat due to continuous cutting by the locals for different uses: timber industry, fuel and wind breaks (Abd Rabou et al., 2008).

16- Cyperaceae

a- *Cyperus rotunds* L.; Saad alhemar

Medicinal properties and uses: Paste of dried tuber is applied on breast of women to secrete more milk and applied on bitten site of scorpion (Muthu et al., 2006).

17- Graminaeae

a- *Cynodon dactylon* (L.) Pers.; Najeel paladi

Medicinal properties and uses: Used for urinary system (Ali-Shtayeh and Jamous 2008). The plant could be used as a folk remedy for convulsions, cough, cramps, cystitis, diarrhea, dysentery, headache, hemorrhage, warts hand wounds (Ali-Shtayeh and Jamous 2008). It provides more and better grazing for horses, sheep and cattle and other grass (Abd Rabou et al., 2008).

18- Labiatae

a- *Marrubium vulgare* L.; Zakoum, Roupiea

Medicinal properties and uses: Leaf is used for treating stomach pain and inflammation bronchitis, nervous system and asthma (Said et al., 2002).

19- Malvaceae

a- *Malva parviflora* L.; Koupeza

Medicinal properties and uses: Expectorant, laxative, astringent, treat night blindness, treat urinary tract diseases, skin diseases and tunors. The leaves are cooked as food (Abu-Rabia, 2005).

20- Myrtaceae

a- Eucalyptus camaldulensis Dehn.; Kafour

Medicinal properties and uses: treating digestive system, cancer, diabetes, urinary system, paralysis, heart, blood, arteries, nervous system, fever, head pain, rheumatism, skin diseases, hair loss and burns (Ali-Shtayeh and Jamous 2008). The timber of the species is used in the furniture and the production of coal and for fuel purposes. The green belts of this plant species are good windbreaks protecting agriculture crops from the negative impacts of storm and winds industry (Abd Rabou et al., 2008).

21-Oleaceae

a- *Olea europea* L.; Alzaitoun

Medicinal properties and uses: Olive oil is used to treat urinary retention and infection, cancer and prostate problems. Smearing olive oil and little salt over a babay's body to strengthen its bones and muscles and prevent diaper rash; to treat venereal diseases and diabetes. Treat kidney stones (Abu-Rabia 2005). Oil and fruit food (Ali-Shtayeh et al., 2008).

22- Palmae

a- *Phoenix dactylifera* L.; Nacheel alpalah

Medicinal properties and uses: treating weight despicable, digestive system, respiratory system, heart , blood, arteries, kidney and urinary system (Ali-Shtayeh and Jamous 2008). Other possible uses can be found in paper production (Amer 2002). The fresh or dried plant fruits are usually eaten or sold by locals. The plant is known to be used to cure

many illnesses such as fevers, cystitis and edema (Abd Rabou et al., 2008).

23- Papaveraceae

a- *Glaucium corniculatum* (L.) J.H. Rudolph; Kraha, Hanoun araies

Medicinal properties and uses: Leaf and fruit are used for eye inflammation (Said et al., 2002).

24- Papilionaceae

a- *Alhagi graecorum* Boiss; Alagoul

Medicinal properties and uses: Used for treating urinary system and stones (Ali-Shtayeh et al., 2000). Plant are known as fodder species (Amer, 2002).

25- Plantaginaceae

a- *Plantago coronopus* L.; Wedna

Medicinal properties and uses: Used for treating stomachache (Yesilada et al., 1999).

26- Portulacaceae

a- *Portulaca oleracea* L.; Rejla

Medicinal properties and uses: Foliage is used for treating kidney stones and sun stroke (Said et al., 2002). Foliage is cooked or eaten raw as salad (Ali-Shtayeh et al., 2008).

27- Rhamnaceae

a- *Ziziphus spina-christi* (L.) Desf.; Alseder

Medicinal properties and uses: Leaf and fruit are used for treating cholesterol reduction, cancer, eye inflammation and hair loss (Said et al., 2002). Plant fruit is eaten raw and leaves are cooked and eaten as snack (Ali-Shtayeh et al., 2008).

28- Rosaceae

a- *Sarcopoterium spinosum* (L.) Spach; Natch

Medicinal properties and uses: Leaf, seed and root are used for treating diabetes (Said et al., 2002).

29- Tamaricaceae

a- *Tamarix nilotica* (Ehrenb.) Bunge; Ethel, Tarf

Medicinal properties and uses: Treating tooth (Ali-Shtayeh and Jamous 2008). The plant was overexploited for its timber which was used as up-righting objects to grapevines. The exploitation of the species as a fuel material and for charcoal production was also documented (Abd Rabou et al., 2008). Other possible uses are found in fuel, grazing, industry and shade and wind breaks (Amer 2002).

30- Thymelaeaceae

a- *Thymelaea hirsuta* (L.) EndL.; Metnana

Medicinal properties and uses: Foliage is used for treating skin diseases (Said et al., 2002). The plant can be used for fiber production (Amer 2002).

31- Umbelliferae

a- *Foeniculum vulgare* Mill; Shoumar paladi

Medicinal properties and uses: A phrodisiac, diuretic, emmenagogue, galactogoue, stimulat,. Green leaves are eaten raw as a green salad, and also added to cooked food, or tea. Used to increase production of breast milk; sexual desire; and to treat kidney infection (Abu-Rabia 2005).

32- Verbenaceae

a- *Lantana camara* L.; Alzahrat, Waret aldeep

Medicinal properties and uses: A handful of flower is ground with coconut oil and applied topically on the head to get relief from headache (Muthu et al., 2006).

33-Zygophyllaceae

a- *Tribulus terrestris* L.; Tareesa, Shersheer

Medicinal properties and uses: Used for treating arteriosclerosis (Anonym 2000).

The survey of literature indicated that the study area has plenty of medicinal plants to treat a wide spectrum of human ailments/ diseases. Fifty seven ailments/ diseases were investigated for the medicinal plants of the study area which are being treated using 52 species (Table 2). Most of the medicinal species were used for treating skin diseases, followed by Digestive system, Urinary system, Heart diseases, Kidney diseases, Diabetes, Respiratory system, Circulatory system and Hair loss. Twenty- six species were used for treating 26 different ailments/ diseases (Table 2).

In conclusion, many of the important medicinal species are facing the danger of extinction in the area. Rapid urbanization and unplanned exploitation have resulted in the loss of such medicinally important species. Therefore, it is imperative to find ways to encourage practices for promoting conservation. There is a need for coordination and cooperation among various agencies. An establishment of a local society as soon as possible, for the traditional medicine will be able to exchange knowledge between scientists and practitioners in order to develop new treatment methods and eliminate the use of harmful remedies.

Table (1): Summary of medicinal plants diversity of Gaza Valley, Gaza Strip, Palestine.

S. No.	Family	Total species	Medicinal species
1	Amaranthaceae	4	2
2	Apocynaceae	1	1
3	Cactaceae	1	1
4	Caryophyllaceae	10	2
5	Chenopodiaceae	8	2
6	Compositae	34	5
7	Cruciferae	11	2
8	Cupressaceae	1	1
9	Cyperaceae	1	1
10	Euphorbiaceae	5	5
11	Graminaeae	30	1
12	Labiatae	4	1
13	Liliaceae	2	2
14	Malvaceae	2	1
15	Mimosaceae	3	2
16	Moraceae	2	2
17	Myrtaceae	1	1
18	Oleaceae	1	1
19	Palmae	1	1
20	Papaveraceae	4	1
21	Papilionaceae	26	1
22	Plantaginaceae	4	1
23	Polygonaceae	4	2
24	Portulacaceae	1	1
25	Rhamnaceae	1	1
26	Rosaceae	1	1
27	Solanaceae	7	3
28	Tamaricaceae	1	1
29	Thymelaeaceae	1	1
30	Umbelliferae	6	1
31	Urticaceae	3	2
32	Verbenaceae	1	1
33	Zygophyllaceae	1	1
Total		**183**	**52**

Table (2): Major diseases treated using 52 medicinal plants from the study area.

S. No.	Diseases treated	Spp. #	Percentage
1	skin diseases	16	30.7
2	Digestive system	14	26.9
3	Urinary system	10	19.2
4	Heart diseases	9	17.3
5	Kidney diseases	8	15.3
6	Diabetes	8	15.3
7	Respiratory system	6	11.5
8	Circulatory system	6	11.5
9	Hair loss	6	11.5
10	Nervous system	5	9.6
11	Blood	5	9.6
12	Rheumatism	5	9.6
13	Cancer	5	9.6
14	Stomach	5	9.6
15	Diuretic	4	7.7
16	Wounds and stinging	4	7.7
17	Liver diseases	3	5.8
18	Fever	3	5.8
19	Poisonous	3	5.8
20	Prostate disorder	3	5.8
21	Bacterial infection	2	3.8
22	Sexual weakness	2	3.8
23	Eye inflammation	2	3.8
24	Coughing	2	3.8
25	Blood pressure	2	3.8
26	Intestine pain	2	3.8
27	Inflammation	2	3.8
28	Antipyretic	2	3.8
29	Head pain	2	3.8

… continue table (2)

S. No.	Diseases treated	Spp. #	Percentage
30	Secrete more milk in women	2	3.8
31	Poisoning infertility	1	1.9
32	Inflammation bronchitis	1	1.9
33	Asthma	1	1.9
34	Cholesterol reduction	1	1.9
35	Emmenagogue	1	1.9
36	Galactogoue	1	1.9
37	Aphrodisiac	1	1.9
38	Stimulat	1	1.9
39	Night blindness	1	1.9
40	Astringent	1	1.9
41	Tumors	1	1.9
42	Vginal diseases	1	1.9
43	Gonorrhoea	1	1.9
44	Alexiteric	1	1.9
45	Emollient	1	1.9
46	Irritant	1	1.9
47	Asedative	1	1.9
48	Tooth	1	1.9
49	Muscular system	1	1.9
50	Organ Britain system	1	1.9
51	Psoriatic	1	1.9
52	Burns	1	1.9
53	Mouth ulcers	1	1.9
54	Gall bladder stones	1	1.9
55	Paralysis	1	1.9
56	Weight despicable	1	1.9
57	Ulcer goiter	1	1.9

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