DIVERSITY OF MEDICINAL PLANTS IN THE FLORA OF SAUDI ARABIA 3: AN INVENTORY OF 15 PLANT FAMILIES AND THEIR CONSERVATION MANAGEMENT

Mohammed Yusuf¹, Mai M. Al-Oqail², Ebtesam S. Al-Sheddi³, Adnan Jathlan Al-Rehail⁴, M. Atiqur Rahman⁵*

¹Department of Pharmacognosy, College of Pharmacy, King Saud University
²Department of Botany, University of Chittagong, Bangladesh
³*Corresponding author. atiquerahman125@hotmail.com

Abstract
An inventory of medicinal species diversity in the flora of the Kingdom of Saudi Arabia has been made for 15 angiosperm families, viz. Boraginaceae, Convolvulaceae, Cucurbitaceae, Fabaceae, Molluginaceae, Papaveraeae, Portulacaceae, Ranunculaceae, Rhamnaceae, Rutaceae, Tamaricaceae, Tiliaceae, Urticaceae, Verbenaceae and Vitaceae, and 61 species of medicinal plants are recognized. These families are represented in the flora by a total of 393 species of which 15.52% are medicinal. Among the families, the Fabaceae is found to be represented by 23 medicinal species which is highest and 37.70% of the total species. Of these 61 medicinal species, 72.13% exhibits herbaceous life form while remaining 13.11% and 14.75% exhibit shrubs and trees respectively. An enumeration of these medicinal species is presented, each with current nomenclature, Arabic name, English name, medicinal uses, pharmacological properties and status of occurrence in the flora. The communication is aimed at emphasizing the planning and implementation of national conservation strategies for sustainable management of the medicinal plants of the Kingdom of Saudi Arabia.

Key words: Medicinal plant, diversity, inventory, Saudi Arabia
Introduction

The flora of Saudi Arabia is one of the richest biodiversity areas in the Arabian Peninsula having a large number of endemic species. This is due to variation in landform, soil, latitude, longitude and isolation from other geographical regions. The components of the flora are the admixture of the elements from Asia, Africa and Mediterranean region. A total of 2,250 species in 142 families are represented in this flora. Of these, 242 species are endemic and 600 species are rare and endangered (Collenette, 1999; Rahman et al., 2004).

Medicinal plant is a valuable component of the biodiversity. But its complete inventory in the Kingdom has not yet been completed. A family wise survey is in progress to complete the inventory under the auspices of Medicinal, Aromatic and Poisonous Plant Research Center and the Department of Pharmacognosy, College of Pharmacy, King Saud University, Riyadh. In the meantime two inventory reports, one with 7 families and another with 8 families, have already been published (Rahman et al., 2004; Yusuf et al., 2014).

Importance of the study on the Saudi medicinal plants, their folk medicinal uses and inventory for conservation management have been stated in Mosa et al. (1987, 2000) and Rahman et al. (2004).

The present report is the third of the series which deals with 15 families, viz., Boraginaceae, Convolvulaceae, Cucurbitaceae, Fabaceae, Molluginaceae, Papaveraeae, Portulacaceae, Ranunculaceae, Rhamnaceae, Rutaceae, Tamaricaeae, Tiliaceae, Urticaceae, Verbenaceae and Vitaceae. These families are represented in the flora of Saudi Arabia by 393 species, individually by 62, 35, 15, 184, 7, 11, 4, 12, 8, 3, 8, 17, 8, 13 and 6 species respectively which is about 17.5% of the total species (Collenette, 1999; Chaudhary, 1999-2001).

In this study importance has given on the identification and inventorying of medicinal plant taxa, documentation of folk medicinal uses, assessment of conservation status and making recommendations for conservation management of threatened taxa.

Material and Methods

The present study was conducted as a part of the analysis of the medicinal plant diversity in the flora and to determine their status in the wild for giving conservation priorities. Only 15 families, viz., Boraginaceae, Convolvulaceae, Cucurbitaceae, Fabaceae, Molluginaceae, Papaveraeae, Portulacaceae, Ranunculaceae, Rhamnaceae, Rutaceae, Tamaricaeae, Tiliaceae, Urticaceae, Verbenaceae and Vitaceae were selected for the study.

Literature resources

Relevant floristic literature, such as, Migahid (1996); Collenette (1999); Chaudhary (1999-2001); Al-Jowaid (1999); Rahman et al. (2002a, 2002b) and medicinal literature, such as, Nadkarni (1954); Chopra et al. (1956, 1982), Watt and Gerdina (1962), Kingsbury (1964); Al-Shanwani (1966); Anonymous (1972); Anonymous (1976); Chopra (1977); Dastur (1977); Hikino et al. (1977); Morton (1977); Leucas (1978); Kirtikar and Basu (1981); Smith and Culvenor (1981); Baulos (1983); Ageel et al. (1987a and 1987b); Al-Yahya et al. (1987, 1990);
Mossa *et al.*, (1987, 2000); Asolkar *et al.* (1992); Muhammad (1992); Shahina and Ghazanfar (1994); Batanouny (1999); Yusuf *et al.* (2009) were surveyed.

**Herbarium resources**

Herbarium specimens of medicinal plants available in the Herbarium of the College of Pharmacy, King Saud University were studied, where voucher specimens of the medicinal plants collected during last two decades are preserved. The distribution and status of occurrence of the medicinal species of each of these families were assessed through field investigations conducted during the period 2010-2013, survey of preserved herbarium specimens and consultation of relevant literature as mentioned above in literature resources.

An enumeration of these 61 medicinal plants is given in Table 2 along with Arabic names, medicinal properties, folk medicinal uses, distribution and status of occurrence in the flora. Families and species under each family are arranged alphabetically with voucher number.

**Results and discussions**

A total of 393 species are present in the flora under the following 15 families: Boraginaceae, Convolvulaceae, Cucurbitaceae, Fabaceae, Molluginaceae, Papavaraeeae, Portulacaceae, Ranunculaceae, Rhamnaceae, Rutaceae, Tamaricaceae, Tiliaceae, Urticaceae, Verbenaceae and Vitaceae. These are distributed by 62, 35, 15, 184, 7, 11, 4, 12, 8, 3, 8, 17, 8, 13, 6 species respectively (Table 1). Among the families, the Fabaceae is the dominant, represented in the flora by 184 species of which 23 (12.5%) are medicinal. On the other hand, the highest rate of medicinal species diversity within the family is found to be 66.6% in the Rutaceae.

It is observed that about 15.52% of the species are medicinal (Table 1) which is less than the first report 33.86% (Rahman *et al.*, 2004) but higher than the second report 13.8% (Yusuf *et al.*, 2014). It is, therefore, found from the results of these three reports that the 30 families are represented in the flora of Saudi Arabia by a total of 1241 species of which 229 (18.45%) are medicinal.

The study showed that these species are widely used by the local people and herbalists for the treatment of 110 ailments (Table 2). The study also revealed that the life forms of these species were distributed to herbs, shrubs and trees by 44, 8, 9 species, respectively (Table 1).

**Table 1: Status of the medicinal plants in the selected families from the Flora of Saudi Arabia**

| Family         | Total sp. | Medicinal species | % of Med. Species | Rare & Endangered | Herbs | Shrubs/undershrubs | Trees |
|----------------|-----------|-------------------|-------------------|-------------------|-------|-------------------|-------|
| Boraginaceae   | 62        | 6                 | 9.67              | -                 | 6     | -                 | -     |
| Convolvulaceae | 35        | 3                 | 8.57              | -                 | 3     | -                 | -     |
| Cucurbitaceae  | 15        | 5                 | 33.33             | -                 | 5     | -                 | -     |
Medicinal plants status, as shown in Table 1 and 2, revealed that 5 species are threatened in the wild. Emphasis has been given on these species for setting up conservation priorities for sustainable management of the medicinal plants of the Saudi flora.

It has been identified that lack of trained taxonomists and conservationists, lack of sufficient data and high risk of conducting field investigations in the desert and stony mountains are the major problems which cause a slow progress of inventory. Inventory project for the production of Red Data Book as of IUCN recommendations (IUCN, 2001) has not been taken yet for the flora of Saudi Arabia.

Priority should be given for complete inventory of rare and threatened medicinal plants and its inclusion in the national policy, along with the documentation of folk medicinal uses through different development projects. Medicinal Plant Conservation Strategy is to be framed and implemented for sustainable management and use of folk medicinal knowledge.

The study has been carried out under a project of inventory of Saudi medicinal plants with documentation of folk medicinal uses, and it is the third report of the series which identifies the threatened medicinal taxa for setting up of Medicinal plant Conservation Strategies in Saudi national policies. It confirms the previous results (Rahman et al., 2004; Yusuf et al., 2014) and provides valuable data for production of Red Data Book of flowering plants of Saudi Arabia following IUCN criteria (IUCN, 2001).

**Conclusion**

Indigenous knowledge of medicinal plants is ancient in Saudi Arabia and still exists among the tribal and village peoples and traditional practitioners. A great number of medicinal plant species present in the flora of Saudi Arabia, which is expected to be more than 1200 (over 50%) of the flora (Mossa et al., 2000). It is known from the previous reports (Rahman et al., 2004; Yusuf et al., 2014) that about 24% plants are medicinal in 15 families of which 30.1% are rare or threatened. Including the present report, medicinal species diversity in the flora is found to be 18.45%. Documentation of this medicinal knowledge is meager and the inventory of rare
and threatened plants for Red Data Book of Saudi Arabia has not been made yet. This valuable knowledge is depleting at a faster rate with the advancement of civilization and easy availability of modern medicine and more and more medicinal plants are disappearing from the flora. It is therefore, needed to give priorities on the documentation of the indigenous knowledge and conservation of the medicinal plants in both in-situ and ex-situ condition through national conservation strategy before disappearance of vulnerable species. The present study gives emphasis on conducting further research on the flora of Saudi Arabia for the identification and inventorying of medicinal as well as threatened plants and documentation of folk medicinal uses for taking appropriate conservation measures.

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### Table 2. Enumeration of Saudi medicinal species diversity in 15 plant families

| Arabic names | Medicinal taxa | Pharmacological Properties with plant parts & references | Status of occurrence; Distribution |
|--------------|---------------|---------------------------------------------------------|-----------------------------------|
| **Boraginaceae** | | | |
| 1. Anchusa milleri Wild. | Harrah | CNS stimulant & neuromuscular blocker [Al-Yahya, 1983a]; Diuretic (WP) [Ageel, 1987a] | Used for the treatment of fever, cough & syphilis (WP) [Ageel, 1987a] | Northern region & Najd (common) |
| 2. Heliotropium digynum (Forsk.) Asch. ex Christ. Shrubs; 16162 (HCP) | Karee | Used for the treatment of dog bite & skin diseases (WP) [Al-Yahya, 1990] | North, on red sands (common) |
| 3. Heliotropium europaeum L. var. lasiocarpum (Fisch. & Mey.) Kazmi. Herb; 12809 (HCP) | Ekrar | Emetic [Nadkarni, 54]; Hepatotoxic (WP) [Kingsbury, 1964] | Used for the treatment of snake bite (WP) [Nadkarni, 1954] | All region (common) |
| 4. Heliotropium longiflorum (Hochl. & Steud. ex DC.) Jaub. & Spach. Herb; 12598 (HCP) | Raqraq | Possesses antibacterial activity (WP) [Al-Yahya, 1983b] | Used for eye & skin infections (WP) [Shahina, 1994] | Southern hills (common) |
| 5. Heliotropium striatum Wild Herb, 10525 (HCP) | Radmim | Laxative & diuretic (WP) [Nadkarni, 1954] | Used for sore eyes & sores, stings of nettles, insects & snake bite (WP) [Nadkarni, 1954] | Southern & Western region (common) |
| **Cucurbitaceae** | | | |
| 6. Trichodesma africanaum (L.) R. Br. Herb;15850 (HCP) | Humimin | Emollient, alternative & diuretic (WP) [Nadkarni, 1954] | Toxic due to the presence of pyrrolizidine alkaloids (WP) [Smith, 1981] | Northern region (common) |
| **Convolvulaceae** | | | |
| 1. Convolvulus arvensis L. Twining herb; 14239 (HCP) | Ollaqi | Purgative & antihaemorrhagic (WP) [Watt and Gerdina, 1962; Chopra et al., 1982] | Used to stop bleeding (WP) [Watt and Gerdina, 1962; Chopra et al., 1982] | Almost all region (common) |
| 2. Cressa cretica L. Herb; 11506 (HCP) | Nandawep | Tonic, aphrodisiac, expectorant & antihelminthic (WP) [Anonymous, 1976] | Used as tonic & in sexual debility (WP) [Anonymous, 1976] | On salt flats inland & near sea (common) |
| 3. Ipomoea eriocarpa R. Br. Twining herb. | Hub Nil | Used for rheumatism, headache, epilepsy, leprosy & ulcers (WP) [Chopra et al., 1956] | Used for rheumatism, headache, epilepsy, leprosy & ulcers (WP) [Chopra et al., 1956] | South-West region (rare) |
| **Cucurbitaceae** | | | |
| 4. Citrullus colocynthis (L.) Schrader. Prostrate vine; 11737 (HCP) | Share, Haranbal | Hydrogogue, cathartic, diuretic, emetic, gastro-intestinal irritant, expectorant & alternative (Fr) [Nadkarni, 1954] | Used in jaundice, ascites, urinary diseases, rheumatism, abdominal enlargement, cough & asthma (R) [Nadkarni, 1954] | Almost all region (common) |
| 5. Cucumis melo L. Prostrate herb; 16155 (HCP) | Share, Haranbal | Emetic & purgative. Fruit mild purgative & causes nausea (WP) [Chopra et al., 1956] | Used in constipation. | Widespread (common) |
| **Melothriea maderaspatinae L. Prostrate or climbing herb.** | | | |
| 3. Melothria apertient (Sh); Sudorific (S) [Chopra et al., 1956] | Melothria | Aperients (Sh); Sudorific (S) [Chopra et al., 1956] | Used for vertigo & biliousness (Sh); Ralitulsion & toothache (R); applied on strained backs (S); [Chopra et al., 1956] | South Hijaz (rare) |
| **Momordica balsamina L. Climber;10610 (HCP)** | Maalhooda Beslama | Tonic, stomachic, stimulant, emetic, antibilious, laxative & alterative (Fr); gallactagogue (L); astrigent (R) [Nadkarni, 1954]. | Used for gout, rheumatism, diabetes & disorders of liver & spleen (Fr); for piles (R) [Nadkarni, 1954]. | Southern region (common) |
| **Coccinia grandis** (L.) Voigt. Climber; 12844 (HCP) | Moghad; Tandheeb | Possesses hypoglycaemic activity (RL) [Assolker, 1992] | Used in diabetes, anorexia, epilepsy, asthma, fever, dropsy, catarrh, gonorrhoea & skin eruptions (L) [Yusuf et al., 2009] | Widespread in South-West hills (common) |
| **Fabaceae** | | | |
| 1. Abrus precatorius | Shaklam Share, Aín-al-Adraet | Purgative, emetic, tonic, aphrodisiac & abortifacient (S); Emetic, astringic & diuretic (R) [Yusuf et al., 2009] | Used in diarrhea, dysentery, sciatica, paralyssis & stiffness of shoulder joint. Poisonous in large doses (S); in obstinate cough, sore throat (R) [Yusuf et al., 2009] | South-western mountains (rare) |
| 2. Acacia farnesiana | Anbar | Astringent, anthelmintic, antidyserenteric (Bk). Stimulant, antiparasitic, aphrodisiac & insecticidal (Fl) [Mossa, et al., 1987; Yusuf et al., 2009] | Used in stomatitis, bronchitis, leucoderma & ulcers (Bk): in gonorrhoea (TL); in diarrhea (Fr); in spermatorrhoea (O). [Mossa, et al., 1987; Yusuf et al., 2009] | Cultivated & selfsown in almost all region (common) |
| 3. Acacia nilotica (L.) Willd. ssp. indica (Benth) Bremen Tree. | Tah; Sant | Astringent, anthelmintic, demulcent (Bk). Expectorant, astringent, antipyretic, antidyserenteric & styptic (G) [Yusuf et al., 2009] | Used in cough, bronchitis, diarrhea, dysentery, piles & leucoderma (Bk); useful in diabetes, dysentery, diabetes mellitus & sexual debility (G) [Yusuf et al., 2009] | Cultivated in many places (common) |
| **Acacia seyal Del. Tree;** | Semail; Tah; | Emollient & astringent (G) [Watt and Gerdina, 1962] | Used for colds, epthalamia, diarrhoea, haemorrhage (G); for leprosy (Bk) [Watt and Gerdina, 1962] | Southern region (rare) |
| **Althaea lebbeck** (L.) Benth. Tree, 12789 (HCP) | Labahk | Astringent, aleucretic, cooling (Bk). Astringent (R). Cooling, aphrodisiac, emollient (Fl) [Dastur, 1977; Yusuf et al., 2009] | Used in skin diseases, piles, bronchitis, diarrhoea (Bk): in hemorhania, epthalamia (R), in asthma (Fl) [Yusuf et al., 2009] | Widely cultivated tree (common) |
| **Alhagi graecocorun Boiss. Herb, 15963 (HCP)** | Aaqood | Laxative, diuretic, expectorant (WP); Restorative, aphrodisiac, diuretic, expectorant (Edx) [Chopra et al., 1956; Dastur, 1977] | Used for rheumatism (O); piles (Fl); juice for opacity of cornea (L). [Chopra et al., 1956, Dastur, 1977] | East & central region (rare) |
| **Cistus tenatea L. Vine; 13092 (HCP)** | Harceelah | Cathartic, diuretic, demulcent, vermifuge (R). Cathartic & aperients (S). [Dastur, 1977] | Used for gonorrhoea, irritation of the bladder & urethra (R); for bronchitis & ulcers (L); for constipation, ascites & enlarged abdominal viscera (S) [Dastur, 1977] | Cultivated & wild (rare) |
| **Crotalaria retusa L Herb** | Qalqal | Used in scabies, impetigo (WP); for colic (R); for fever | Used in scabies, impetigo (WP); for colic (R); for fever | SW region |
### 9. Hematosylon campechianum L. Tree
- **Baqam Asaad**
  - Decoction is astringent, tonic & anti-inflammatory (W) [Chopra et al., 1956; Chopra, 1977; Hikino et al., 1977].
  - Used in chronic diarrhea, dyspepsia & leukorrhoea (W) [Chopra et al., 1956; Chopra, 1977; Hikino et al., 1977].
  - Effective in chronic diarrhea, dyspepsia & leukorrhoea (W) [Chopra et al., 1956; Chopra, 1977; Hikino et al., 1977].
  - Improves liver function, reduces cholesterol & triglycerides (W) [Chopra et al., 1956; Chopra, 1977; Hikino et al., 1977].
  - Eastern Najd & eastern region (Cult, rare).

### 10. Indigofera spinosa Forssk. Shrublet; 15794 (HCP)
- **Qatar, Hil, Qasar**
  - Showed cardiotonic & hypotensive effect in rabbit & CNS stimulation on rat (WP) [Morton, 1977].
  - Used as anti-spasmodic & for diarrhea (WP) [Morton, 1977].
  - Cultivated fodder (common).

### 11. Medicago sativa L. Herb; 15784 (HCP)
- **Bassem**
  - Diuretic (L, S), abortifacient (S) [Wat and Gerdina, 1962; Leucas, 1978].
  - Used as diuretic & for diabetes (WP) [Morton, 1977].
  - South & West (common).

### 12. Melilotus albus Medik. Herb; 12785(HCP)
- **Attrah**
  - Astringent & narcotic (WP). Ripen plant can cause colic to milch cattle. [Wat and Gerdina, 1962].
  - An escape from cultivation (rare).

### 13. Melilotus indicus (L.) All Herb; 13124 (HCP)
- **Handaqooq**
  - Discotic, emollient & stimulant (WP) [Wat and Gerdina, 1962; Chopra, 1956].
  - Used in swellings (WP); bowel complaints & indigestible diarrhea (S) [Wat and Gerdina, 1962; Chopra et al., 1956].
  - Southern mountains & east (common).

### 14. Prosopis cineraria (L.) Decc. Tree
- **Ohal**
  - Astringent (Fr) [Nadkarni, 1954; Chopra et al., 1956].
  - Used for rheumatism & Scorpion sting (Br); against miscarriage (Fr) [Nadkarni, 1954; Chopra et al., 1956].
  - Northern & Eastern region (cult. rare).

### 15. Psoralena plicata Del. Herb; 10796 (HCP)
- **Shagatal Na’am**
  - Used for respiratory & intestinal ailments (L); gastric ulcers (Fr) [Baulos, 1983].
  - Eastern region & South Hijaz (common).

### 16. Retama raetum (Forssk.) Webb. & Berthel. Shrub; 15827 (HCP)
- **Ramat**
  - Febrifuge, emetic, purgative, vermifuge, abortive (Br) [Batanouny, 1999].
  - Used for wound & making eye wash (Br); for diarrhea (R) [Batanouny, 1999].
  - Northern areas (common).

### 17. Rhamnus cathartica L. DC. Vine; 11182 (HCP)
- **Abirrificient (L) [Chopra et al., 1956].**
  - Used as aperient in colic (WP); for diarrheaea (L) [Batanouny, 1999].
  - Southwestern region (common).

### 5. Mollugoaceae

| Species | Common Name | Description | Use | Region |
|---------|-------------|-------------|-----|--------|
| 1. Glutus lutosus L. Herb; 15567 (HCN) | Em-Todaa, Ghobaara | Purgative & tonic (WP) [Chopra et al., 1956]. | Used in diarrhea, bilious attacks, wounds & pains in the limbs (WP) [Chopra et al., 1956]. | Nationwide (common). |
| 2. Mollugo cersina (L.) Seringe Herb; 15647 (HCN) | Mollugo | Stomachic, aperient, uterine stimulant, antiseptic &febrifuge (WP) [Nadkarni, 1954]. | Promotes local discharge (WP); used in gouty & rheumatic complaints (R); in fever (Fl, Tsh) [Nadkarni, 1954]. | Scattered localities in the south (common). |

### 6. Papavaceae

| Species | Common Name | Description | Use | Region |
|---------|-------------|-------------|-----|--------|
| 1. Argemone mexicana L. Herb; 12843 (HCP) | Argemone, Teshimzing | Diuretic, alterative & hypotonic (WP); laxative, nauseant, emetic, expectorant & demulcent (S); strong purgative (SO) [Nadkarni, 1954; Mossa et al., 1984]. | Heals ulcers & blisters; used for malaria, scabies (Lt); good for skin diseases & expelling tape worm (R) [Nadkarni, 1954; Mossa et al., 1984]. | Southern foot hills (common). |
| 2. Papaver rhoesas L. Herb; 12674 (HCP) | Shaqal al nunaan | Narcotic & slightly sedative (Lt); tonic (LS); sudorific & high sedative (P) [Chopra et al., 1956]. | Used in low fevers (L, S) [Chopra et al., 1956]. | Southern mountains (rare). |

### 7. Portulacaceae

| Species | Common Name | Description | Use | Region |
|---------|-------------|-------------|-----|--------|
| 1. Portulaca oleracea L. Herb; 12704(HCP) | Rijla, Baqla | Diuretic, refrigerant, astringent & alterative (WP), demulcent, mild astringent, & diuretic (S) [Dastur, 1977]. | Useful in scurvy, liver complaints, haemoptysis, dysuria, burns, skin diseases, diseases of the bladder, kidney & lungs [Dastur, 1977]. | Southern region (common). |
| 2. Portulaca quadrifida L. Herb; 10893 (HCP) | Mortah | Antiseptic (WP); vermifuge (S) [Chopra et al., 1956; Chopra, 1956]. | Used in skin diseases, diseases of the bladder, kidney & lungs, erysipelas & dysuria (WP) [Chopra et al., 1956; Chopra, 1956]. | Southern region (common). |

### 8. Ranunculaceae

| Species | Common Name | Description | Use | Region |
|---------|-------------|-------------|-----|--------|
| 1. Adonis dentata Del Herb; | | Diuretic, aperient, alterative, & diuretic (WP) [Batanouny, 1999]. | Prevents heart failure, oedema & enlargement of the spleen. Used in cardiotonic & cough mixtures (WP) [Batanouny, 1999]. | Northern areas & Asir (common). |
| 2. Nigella sativa L. Herb; 12952 (HCP) | Habibat Barka, Habibat Sooda | Digestive, stimulant, carminative, diuretic, diaphoretic, stomachic, antispasmodic & emmenagogue (S) [Nadkarni, 1954]. | Used for indigestion, loss of appetite, diarrhea, dropsy, fever & for uterine contraction after delivery (S) [Nadkarni, 1954]. | Cultivated in North Hijaz (common). |

### 9. Rhinulaceae

| Species | Common Name | Description | Use | Region |
|---------|-------------|-------------|-----|--------|
| 1. Ziziphus nummularia Lam Tree;15947 (HCP) | Sidr | Astringent, antidiarrhoeic, stomachic, demulcent & anodyne (L). Febrifuge, laxative & emollient (Fr) [Baulos, 1983]. | Used for scabies & boils (S); for bilious affections (Fr); for joint pain, sore throat & bleeding gum (Bk) [Shah, 1990]. | Northern region (common). |
| 2. Ziziphus spina-christi (L.) Willd. Tree;14996 (HCP) | Sidr, Nabq | Astringent, antidiarrhoeic, stomachic, demulcent & anodyne (L). Febrifuge, laxative & emollient (Fr) [Baulos, 1983]. | Used for abscesses, fistulas, tooth aches, sores, wounds & skin diseases (L); used for measles, bronchitis, cough & tuberculosis (Fr); used for | Southern region (common). |
| 10. Rutaceae |  |
| --- | --- |
| 1. *Haplophyllum tuberculatum* (Forssk.) A.Juss. Herb; 16163 (HCP) | Musaikah, Ihi | Diuretic [Muhammad 1992]; Aphrodisiac (WP) [Batanouny, 1999]. | Used for nausea, constipation, malnafial fever, rheumatic pain & gastric [Muhammad 1992]; intestinal worms, ear troubles (WP) [Batanouny 1999]; for scorpion stings (L) [Watt and Gerdina, 1962]. | Widespread (common) |
| 2. *Ruta chalepensis* L. Shrublet; 12873 (HCP) | Shadhab | Antispasmodic, sudorific & nerve stimulant (WP); anthelmintic, antispasmodic, antiseptic, rubefacient & emmenagogue (LO) [Anonymous, 1972]. | Used for fever, convulsions & infant catarh (WP) [Anonymous, 1972]. | Asir & south Hijaz (common) |

| 11. Tamaricaceae |  |
| --- | --- |
| 1. *Tamarix aphylla* (L.) Karst. Tree; 16129 (HCP) | Athel | Bitter, astringent & tonic (Bk) [Nadkarni, 1954]. | Used for eczema capitis (Bk) [Nadkarni, 1954]. | Widely distributed (common) |
| 2. *Tamarix nilotica* (Ehrenb.) Bunge. Shrub; 15597 (HCP) | Tarfa | Used for fever, convulsions & infant catarh (WP) [Anonymous, 1972]. | Asir & south Hijaz (common) |

| 12. Tiliaceae |  |
| --- | --- |
| 1. *Corchorus olitorius* L. Herb; 10894 (HCP) | Malukhia | Diuretic, febrifuge, diuretic & tonic (L); purgative (S) [Watt and Gerdina, 1962; Chopra et al., 1956]. | Used in chronic cystitis, gonorhoea & dysuria; as a galactagogue in abdominal diseases (L) [Watt and Gerdina, 1962; Chopra et al., 1956]. | Cultivated & wild (common) |
| 2. *Corchorus trilocularis* L. Herb; 15636 (HCP) | Malukhia | Demulcent (WP) [Chopra et al., 1956]. | Used in fever & obstruction of the abdominal viscera (S) [Chopra et al., 1956]. | Southern region (common) |

| 13. Urticaceae |  |
| --- | --- |
| 1. *Urtica pilulifera* L. Herb; 14070 (HCP) | Hareeq | Diuretic & depurative (WP); diuretic & aphrodisiac (S). | Used for rheumatism, sore joints, hemorrhage (WP); for renal stones & inflammation of the bladder (S) [Batanouny, 1999]. | Southwestern heights (common) |
| 2. *Urtica urens* L. Herb; 16054 (HCP) | Haraqa | Diuretic & aphrodisiac (WP) [Batanouny, 1999]. | Used for rheumatism, eczema, haemorrhage, kidney troubles, dysmenorrhoea [Batanouny, 1999]; for catarh, bladder pain, whooping cough & nose bleeding (WP) [Watt and Gerdina, 1962]. | Asir (common) |

| 14. Verbenaceae |  |
| --- | --- |
| 1. *Phyla nodiflora* (L.) Greene Herb; 15600 (HCP) | Nomos, Plekha | Diuretic, stomachic, astringent to the bowels & naurant for boils (WP) [Yusuf et al., 2009]. | Good for ulcers, wounds, asthma, bronchitis, knee-joint pain & indigestion (WP) [Yusuf et al., 2009]. | Southern region (common) |
| 2. *Verbena officinalis* L. Herb; 11329 (HCP) | Jajah | Tonic, febrifuge, depurative, aphrodisiac & rubefacient (WP) [Watt and Gerdina, 1962; Chopra et al., 1956]. | Used in fever, anemia, dropsy, amenorrhoea, rheumatism, pleurisy, scrofula, diseases of the joints & nerves (WP) [Watt and Gerdina, 1962; Chopra et al., 1956]. | South & South-west region, in scattered localities (common) |

| 15. Vitaceae |  |
| --- | --- |
| 1. *Cissus quadrangularis* L. Herbaceous vine; 12489 (HCP) | Salah | Laxative, stomachic, tonic & analgesic (S) [Yusuf et al., 2009]; powerful alterative (L,Sh) [Watt and Gerdina, 1962]. | Stem used in piles, tumours, loss of appetite, constipation, otorrhea, epistaxis, scurvy, asthma & as a plaster for broken limbs (S) [Yusuf et al., 2009]. | Southern region (common) |
| 2. *Cissus rotundifolia* (Forssk.) Vahl, Herbaceous vine; 12488 (HCP) | Halqa | Used for muscular rheumatism & earache (R) [Watt and Gerdina, 1962]; for wounds & ulcers (WP). | Southern region (common) |