

## Contribution to the Flora of Hada Elsham Area, Western K.S.A, With special Reference to Their Uses

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### Abstract

The present study has been conducted in Hada El Sham area, Western K.S. A. The study is mainly taxonomic that included collection, preparation, identification and classification of plant species in the study area. A total of 108 plant species were identified belonging to 32 families, and 74 genera, represent the flora of the study area. The study also included a survey of the uses of plant species of the area, where (89) species out of identified species were found to have economic importance. These represent (84%), of the total plant species of the study area. The study reviewed the names of families and species according to recently published corrections, and found some were altered, so they were changed to recent names. It is recommended to conserve the plant species of the study area so as to reduce the encroachment of desertification and preserve the plant species of economic, and medicinal importance.

**Keywords:** Identification; Classification; Plant species; Medicinal values; Economical importance; and arid climates; Hada Elsham; K.S.A.



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### 1. Introduction

Vegetation cover of Saudi Arabia is divided into five broad categories. 1- Vegetation coastal plains and sabkhas. 2- Deserts and scarcely vegetated areas. 3- Dwarf shrub-lands. 4- Woodlands and xeromorphic shrub-lands of high altitude areas. 5- Wadi communities. Saudi Arabia a part of the Arabian Peninsula, covers more than 2 million square kilometers and comprises several distinct physiographical regions, such as mountains valleys, sandy and rocky deserts, salt pans and lava areas (Harrats). The overall climate of the country, except for Asir Province is classified as an arid province within Thornthwaite's global climatic classification [1]. The flora of Saudi Arabian consider the richest biodiversity in the Arabian Peninsula and comprises important genetic resources of crop and medicinal plants and xerophytic vegetation makes up the prominent features of the plant life in the kingdom. According to Collenette [2], the greatest species diversity in Saudi Arabia has occurred in Asir and Hijaz, the western mountainous area of the Kingdom, which borders the Red Sea which can be attributed to a greater rainfall and range of altitude from sea level up to 9,300 m. Many previous studies showed that topography of the study area and climatic conditions are the main factors affecting the degree of speciation. The flora and vegetation cover of Saudi Arabia were extensively studied represented in the work of Collenette [2] and Chaudhary and Al-Jowaid [3], Migahid [4], and Al- Khamis, *et al.* [5], which may be regarded as the standard reference floras of the area. Vegetation of the western part of the country is diverse and dense. These areas mainly divided into coastal Tihama, foothills and escarpment. Wadis and foothills are sparsely vegetated, scattered populations of *Acacia tortilis*, *Maerua crassifolia*, *Ficus palmata*, *Moringa peregrine* and *Ocharadenus baccatus*, can be seen in areas. According to recent estimates [6], Saudi Arabia contains about 2253 species in 132 families, of which about 20% are rare plants. The number of genera currently stands at 837. Among the families, 37 are represented by a single species. The south western region, from Taif to Yamen border contains about 70% of floristic elements of Saudi Arabia [6]. The main objectives of this study are to document the flora of Hada Elsham area, and consequently to contribute in updating the flora of K.S.A., and to document plant species with economic importance.

### 2. Material and Methods

The study was carried out at Hada Al-Sham (21° 48' 3" N, 39° 43' 25" E), Jeddah, Saudi Arabia.

Climate of the study area; characterized by high temperature in summer and warm in winter. The study area has an arid climate and the rainfall apart from it is scantiness is irregular and variables.

The field trips were carried out to the study area for collecting the specimens. Plant specimens were collected fresh from the field, in two collection seasons during 2016 and 2017, from sites representing all the study area. The whole plant was collected in case of herbs and twigs with leaves and flowers and / or fruits in case of shrubs and trees. The specimens were stretched to dry between newspapers and firmly pressed inside herbarium press. Newspapers were continuously changed during the drying period to avoid rotting of material; finally the specimens were mounted, labeled and deposited at the laboratory of Agricultural Research Station of King Adulaziz University, Hdada Al-Sham. Observations were recorded, on the habit, habitat, distribution, color and liquid, during collection trips.

## 2.1. Species Identification

In the laboratory, further analysis and / or identification were done, initially by examining the various parts of the specimens collected using hand- lens. Fine characters were examined under microscope for dissecting the flora parts. The identified specimens were compared with the identified floras by Collenette [2] and Chaudhary and Al-Jowaid [3], Al-Eisawi and Al-Ruzayza [7], Migahid [4], and Alsherif, *et al.* [8], in Saudi Arabia .

The families, genera, and species were all arranged in alphabetical order. Medicinal folkloric and other uses of the collected species have been provided. These uses have been extracted from available literature on Saudi Arabia plants and plants of neighboring countries [9], ELsafori [10], Adjanohoun, *et al.* [11], Al-Shanwani [12]. In addition, some information was obtained from the inhabitants of the study area.

## 3. Results

### 3.1. The Flora

The study reported (108) plant species at the study area. Belonging to 32 families (29 dicots. And 3 monocots). The plants of the study area have been updated ( names, genera and families). The results as follows:

**Table-1.** Flora of Hada Elsham area, Western Saudi Arabia

Family	Species	Habit	Uses
Aizoaceae	<i>Trianthema portulacastrum</i> L.	Pro. Herb	M
	<i>Sesavium verrucosum</i> Raf.	Pro. Herb	E
	<i>Zalya pentandra</i> (L.)Jeffrey	Herb	M
Amaranthaceae	<i>Aerva javanica</i> (Burm.f.)Schultes	Herb	M
	<i>Amaranthus graecizans</i> L.	Herb	F
	<i>Amaranthus lividus</i> L.	Herb	F
	<i>Amaranthus hybridus</i> L.	Herb	F
	<i>Digera muricata</i> (L.) Mart.	Herb	-
	<i>Haloxylon persicum</i> Bunge	Tree	S.D.Fi.
Apocynaceae	<i>Rhazya stricta</i> Decene.	Herb	M
Arecaceae(Palmae)	<i>Phoenix dactylifera</i> L.	Tree	E
Aristolochiaceae	<i>Aristolochia bracteolata</i> Lam.	Herb	M
Asclepiadaceae	<i>Caltropis procera</i> (Ait)Ait.f.	Shrub	M
	<i>Leptadenia pyrotecnica</i> (Forssk.)Dence.	Shrub	S.D.Fi.
Asteraceae(Compositae)	<i>Artemisia monosperma</i> Del.	Bushy	M
	<i>Crepis sancta</i> L.	Herb	-
	<i>Flaveria trinerva</i> (Spreng.)Mohr.	Herb	-
	<i>Launea capitata</i> (Spreng.)Dandy	Herb	M
	<i>Pulicaria crispa</i> (Forssk.) Oliver.	Herb	M
	<i>Sonchus oleraceous</i> L.	Herb	M
	<i>Sonchus tenerrims</i> L.	Herb	E
Balanitaceae	<i>Balanites aegyptiaca</i> (L.) Del.	Tree	M***
Boraginaceae	<i>Heliotropium europaeum</i> L	Herb	F
	<i>Heliotropium terocarpum</i> L.	Herb	F
	<i>Trichdesma africanum</i> (L.) R.Br	Herb	-
Brassicaceae(Cruciferae)	<i>Farsetia aegyptiaca</i> Turra.	Herb	F
	<i>Harwoodia dicksoniae</i> Turril.	Herb	-
	<i>Schimpera Arabica</i> Hochst&Steud.	Herb	-
	<i>Zilla spinosa</i> Prentt	Herb	F
Cappariceae	<i>Capparis cartilaginea</i> Decne.	Shrub	M***
	<i>Capparis decidua</i> (Forssk.)Edgew	Shrub	M***
	<i>Capparis sandwiciiana</i> Dc	Shrub	-
	<i>Dipterygium glaucum</i> Decne.	Herb	M
	<i>Maerua crassifolia</i> (Forssk.)Gilg&Bendict	Tree	M
	<i>Maerua oblongifolia</i> (Forssk.)A.Rich.	climber	F
Chenopodiaceae	<i>Halothamus boltae</i> (Jaub.&Spach)Moq.	Shrub	F
	<i>Salosa imbricate</i> Forssk.	W. Shrub	F
Cleomaceae(Capparaceae)	<i>Cleome gynandra</i> L.	Herb	M***
	<i>Cleome chrysantha</i> Dence	Herb	-
Convolvulaceae	<i>Convolvulus arvensis</i> L.	Climber	F
	<i>Convolvulus glomeratus</i> Choisy	Trailing	-
	<i>Convolvulus pilosellifolius</i> Desr.	Pro. Herb	-
Cucurbitaceae	<i>Citrulus colycynthis</i> (L.)Shrad	Pro. Herb	M***
Cyperaceae	<i>Cyperus rotundus</i> L.	Herb	M***

Euphorbiaceae	<i>Euphorbia aegyptiaca</i> Bioss.	Herb	M
	<i>Euphorbia granulata</i> Forssk.	Herb	-
	<i>Euphorbia helioscopia</i> L.	Herb	M
	<i>Euphorbia hirta</i> L.	Herb	M***
	<i>Jatropha glauca</i> Vahl.	Shrub	M
	<i>Phyllanthus rotundifolia</i> Willd	Herb	M
	<i>Ricinus communis</i> L.	Shrub	M
Fabaceae	<i>Acacia ehrenbergiana</i> (Forssk.)Hayne	Tree	M
Sub.f.Mimosoideae	<i>Acacia orerefota</i> (Frossk.)Schweinf.	Shrub	M
Sub.f.Mimosoideae	<i>Acacia modesta</i> Wall.	Tree	F
Sub.f.Mimosoideae	<i>Acacia tortilis</i> (Forssk.)Hayne	Tree	F
Sub.f.Mimosoideae	<i>Acacia tortilis</i> (Forssk.) <i>subsp. raddina</i>	Tree	F
Sub.f.Faboideae	<i>Indigofera oblongifolia</i> Forssk.	Herb	-
Sub.f.Faboideae	<i>Indigofera hochsterri</i> Bak.	Herb	-
Sub.f.Faboideae	<i>Indigofera spinosa</i> Forssk.	Herb	-
Sub.f.Mimosoideae	<i>Prosopis juliflora</i> (Sw.)Dc.	Tree	F
Sub.f.Faboideae	<i>Tephrosia nubica</i> (Bioss.)Baker	Herb	M
Sub.f.Faboideae	<i>Tephrosia quartiniana</i> Cufod.	Herb	M
Sub.f.Faboideae	<i>Tephrosia purpurea</i> (L.)Pers.	Under shrub	M***
Sub.f.Caesalpinioideae	<i>Senna alexandrina</i> Mill.	Herb	M
Sub.f.Caesalpinioideae	<i>Senna italic</i> Mill.	Herb	M
Lamiaceae (Labiatae)	<i>Ocimum basilicum</i> L.	Herb	M
Liliaceae	<i>Aloe vera</i> (L.)Burm.f.	Herb	M***
Malvaceae	<i>Abutilon figarianum</i> Webb.	Herb	M
Nyctaginaceae	<i>Boehervia erecta</i> L.	Herb	M***
	<i>Boehervia repens</i> L.	Herb	M***
Oleaceae	<i>Olea europoea</i> L.	Tree	M
Poaceae (Graminae)	<i>Cenchrus ciliaris</i> L.	Grass	F
	<i>Chloris gyagana</i> Kunth.	Grass	F
	<i>Cynodon dactylon</i> (L.)Pers.	Grass	M***
	<i>Dactyloctenium aegyptium</i> (L.)Willd.	Grass	F
	<i>Digitaria abscondens</i> (Kunth.) Henrard	Grass	F
	<i>Echinochloa colonum</i> (L.)Link	Grass	F
	<i>Eleusine indica</i> (L.)Gaertn.	Grass	F
	<i>Eragrostis diplachnoides</i> Steud.	Grass	F
	<i>Panicum lantoidate</i> Retz.	Grass	F
	<i>Phalaris minor</i> Retz.	Grass	F
	<i>Panicum turgidum</i> Forssk.	Grass	F
	<i>Pennisetum divisum</i> (Gmel.)Henr	Grass	F
	<i>Pennisetum setaceum</i> (Forssk)Chiov.	Grass	F
	<i>Tragus racemosus</i> (L.)All.	Grass	F
	<i>Setaria viridis</i> (L.)P.Beauv.	Grass	F
	<i>Setaria verticillata</i> (L.)P.Beauv.	Grass	M
	<i>Sporobolus minutus</i> Link	Grass	F
	<i>Stipagrostis hirtiglum</i> ( Steud.ex.Trin)Dewinter	Grass	F
Portulacaceae	<i>Portulaca oleracea</i> L.	Herb	M***
	<i>Portulaca quadrifida</i> L.	Herb	M***
Resedaceae	<i>Ochradens baccatus</i> Del.	Shrub	F
Rhamnaceae	<i>Ziziphus spina-christi</i> (L.)Desf.	Tree	M***
	<i>Ziziphus spina-christi var.inermis</i>	Tree	E
Solanaceae	<i>Solanum nigrum</i> L.	Herb	M***
	<i>Wathania somnifera</i> (L.)Dunal.	Herb	M
Tamaricaceae	<i>Tamarix aphylla</i> (L.)Karst.	Tree	F
Tiliaceae	<i>Corchorus depresses</i> Stocks.	Pro. Herb	E
	<i>Corchorus trilocularis</i> L.	Herb	E
	<i>Grewia tenex</i> L.	Shrub	M
Urticaceae	<i>Forskoala tenacissima</i> L.	Herb	M
Zygophyllaceae	<i>Fagonia bruguieri</i>	Herb	M
	<i>Fagonia cretica</i> L.	Herb	M
	<i>Fagonia indica</i> L.	Herb	M
	<i>Fagonia paulyana</i> J.Wagner&Vierh	Herb	-

	<i>Peganum harmala</i> L.	Herb	M
	<i>Tribulus bimucronatus</i> Kralik	Pro. Herb	M
	<i>Tribulus terrestris</i> L.	Pro. Herb	M

M\*\*\*: top powerful medicinal uses, M: medicinal uses, F: fodder uses., E: edible., S.D.F.: sand dunes fixation.

M\*\*\*: powerful medicinal uses, M: medicinal uses, F: fodder uses, E: edible uses, S.D.F.: sand dunes fixation.

From the identified species of the present study (89) species out of the total number, were found have medicinal ,fodder and edible values, these represent (84%), of the total flora. The number of species have medicinal values (51), fodder values (32) and edible values (6), respectively. The medicinal plants represent (48.1%), fodder plants represent (30.2%) and edible plants represent (5,7%),of the total flora. Top 16 plant species of medicinal plants were found have powerful medicinal uses (M\*\*\*). The study revealed that among the herbaceous plants the use of grasses for medicinal purposes is very rare.

## 4. Discussion

The collection from the study area covered different habitats, and a total number of (106) plant species were studied. These species belong to (32) families (29) Dicotyledonous and 3 monocotyledonous). Most of the species of the study area were widely distributed in the country. The families were represented with a reasonable number of species, some with only one species, due to lack of suitable habitats. The study area is generally sparsely vegetated and has low species diversity. This may be attributed to rainfall fluctuations, sand rifts, overgrazing, and excessive use. The present study found similar findings to Chaudhary and Al-Jowaid [3], and Collenette [2].

## 5. Conclusion

The most common dicotyledonous families were Fabaceae, and Euphorbiaceae, whereas the most important monocotyledonous family was poaceae. The most common dicotyledonous woody species were *Acacia ehrenbergiana*, *Acacia tortilis subsp. raddiana* and *Maerua crassifolia*, whereas the herbaceous species were *indigofera ssp.*, and *Corchorus ssp.* The most common monocotyledonous species were *Dactyloctenium aegyptium*, *Setaria ssp.*, *Cynodon dactylon*, *Eragrostis ssp.*, and *Digera muricata*.

The flowering plants of the study area were revised and updated, particularly names, genera and families. The Study explained that some names of families and species were altered. These were changed according to published corrections. The families changed were (Palmeae to Arecaceae, Compositeae to Asteraceae, Cruciferae to Brassicaceae, Labiateae to Lamiaceae, and Graminae to Poaceae).

The species changed were (*gynandropis gynandra* to *Cleome gynandra*, and shifted from family Capparaceae to Cleomaceae, and *Acacia nubica* to *Acacia oerfota*).

## Recommendations

From the above mentioned, the plants conservation, must be considered so as to reduce the encroachment of desertification, and to preserve plant species of economic importance and medicinal values. This is evident from field observations, meteorological data and personal communication with elderly people in the study area.

There is a need for reseeded of plant species. Management of these plants should conform to the ecological factors prevailing in the study area.

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