



Contents

Introduction	10
The Land and its Climate	12
The Vegetation of the United Arab Emirates	14
Glossary	16
List of Plant Family Names	21
Description and Colour Plates of the Species	22
Rare and Threatened Species	122
List of Arabic and Scientific Names	123
Index of Scientific Names	126
References	128
Appendix:- New Check List of Vascular Wild Plants in the U.A.E.	129



Introduction

Human beings have always had a vital interest in plants of all kinds. In ancient times knowledge of which plants were useful, generally as food, and which were harmful was essential to their survival. Later, as civilizations became more sophisticated, plants came to be used for a wider variety of purposes, including medicines, fibres, dyes and as superstitious or religious objects. Most people could recognise the more important plants, and each region or culture developed its own names for each kind of plant. In modern times the need for every individual to be able to

recognise plants has diminished. Many medicines are still derived from plants and many plants are still used as culinary herbs or spices, but now they are usually obtained in a processed form, ready for use.

It is also clear from their name that wild flowers are essentially wild plants – that is, they grow naturally where they do, without human interference and indeed often despite it.

This book is intended as a simple guide to the identification of about 100 common and rare wild plant



species in the U.A.E. These plants are illustrated in colour and described in detail in order to help the naturalist or expert to make positive identifications in the field.

The text describes the distinctive features of genera as well as of individual species according to the following criteria Habitat, stem branches, leaves, inflorescence, flowers, fruit, taxonomic notes, ecological notes, (flowering time), distribution, Scientific and Local Arabic names. The text has been arranged alphabetically according to families as well as genera and species within these families.

Many attempts have been made by plant taxonomists to publish a com-

prehensive guide from their observations, but these have proved far from complete and unsatisfactory. In recent years a number of ecologists and plant geographers have travelled in the U. A. E., published valuable data and contributed to our knowledge about plants in this region, (EL-Ghonemy 1985, Johgbloed 1987 and Western 1989). However there is still no detailed and complete description or knowledge about the floral richness of the U.A.E.

Since 1990 I have lived and travelled extensively in the U.A.E., developing extensive floristic collections. These collections enabled me to prepare this book and the new check list of the vascular wild plants of the United Arab Emirates.

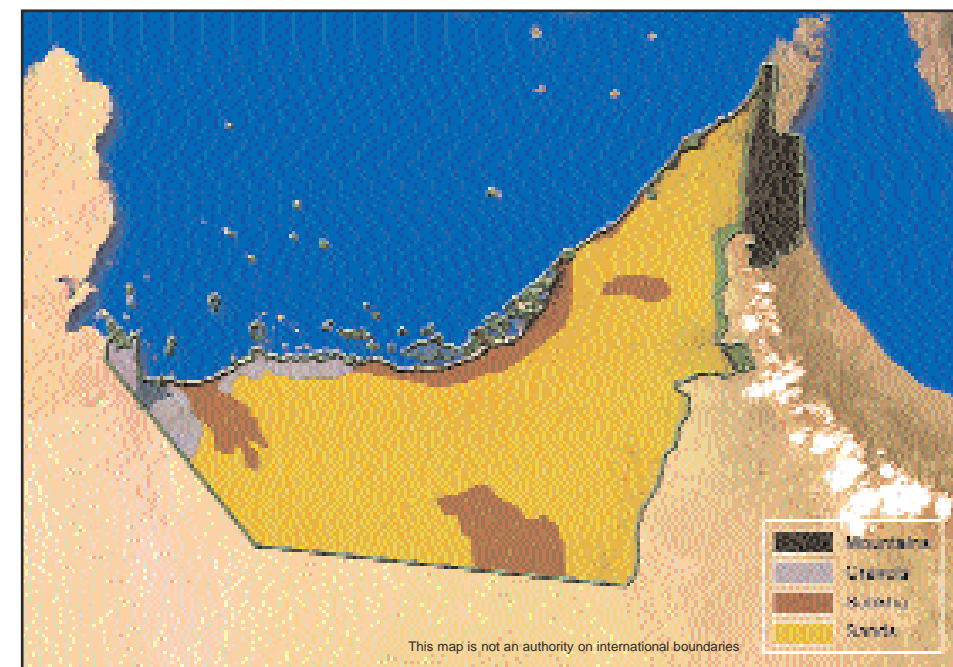


Fig. 2: United Arab Emirates map showing the surface exposure



The Land and its Climate

The United Arab Emirates, with an area of 83000 Km², is a place of extremes. A dry land covered by Wadis, waterless riverbeds, sand dunes, plains and mountains. It lies in the south-east of the Arabian Peninsula between 20° and 26° N latitude and 51° and 56° E longitude. It is situated between Qatar and Saudi Arabia in the west, the Arabian Gulf in the north, Oman and Gulf of Oman in the east and Saudi Arabia in the south.

The dry heat of the desert makes it difficult for soils to develop. Dead vegetation shrivels up and blows away instead of rotting and being washed down as a nutrient into the ground. Summer temperatures in this desert can reach over 50°C while in winter the nights can be so cold that what little moisture there is freezes, leaving the sand a shimmering white in the cold morning sun. The temperature range between night and day can be as much as 20°C. However a brief shower can cause grasses and flowers to appear in only a few weeks on barren land. The sands, apparently devoid of life during the day, will after a windless night be criss-crossed by the tracks of nocturnal creatures such as desert foxes or gerboa, the tiny rodents closely related to the domestic gerbil. Nature in the desert

has learned to win the battle for survival by adapting to the lack of water and extremes of temperature, girding itself in readiness for the occasional rains. When they come, life takes on a frantic pace before moisture evaporates once more and drought returns to the land.

Finally the climate of this region is characterized by low rainfall and high temperatures; the mean annual rainfall being 70 - 150 mm, the mean maximum air temperature in June is 43.6 °C while the mean minimum air temperature in January is 8.5°C and the mean annual relative humidity is over 70% (metrological reports - Aviation 1998 Abu-Dhabi).

Topographically the U. A. E. divides into four areas: the mountain zone in the north and east, gravel plains west of the mountains, the coastal strip where most of the towns are located and the great desert of the interior (Fig 2). Apart from the mountains, the landscape is dominated by geologically recent overlying sediments plus marls, shale deposits and evaporites.

The U. A. E. has two coastlands, East and West and for our purposes these are treated as separate zones. Between Sila and Dubai there are

large areas of recently formed saline flats (sabkha) extending inland for up to 20 km. The true Sabkha with its impermeable substrata and evaporitic crust of gypsum, anhydrite and calcite, supports only non-vascular plants.

The United Arab Emirates consists of a drowned coastline with a high number of near-shore islands, some of them true islands only at high tide. The creeks and lagoons of Dubai, Sharjah, Ajman and Umm al Qawain are interspersed with small sabkhas, some of them with a thin covering of wind blown sand.

Between Abu Dhabi and Dubai the slope inland is imperceptible except for the presence of small stabilized dunes. Fossil dunes are a feature north of Sharjah, but beyond Ras al Khaimah the coastal plain becomes more and more constricted by the curve of the mountain belt which reaches to the sea at Sha'am and which provides a physical boundary between the U. A. E. and the northern tip of Oman. The highest mountains of the coastal peaks is Ras Al-Jebal over 1450m, forming an effective barrier between the two countries or the two Gulfs, (Arabian and Oman Gulfs, Fig. 1.)

There are major north-eastern bays at Khor Fakkan and Dibba, both of which are being developed into modern harbours. Around Khor Kalba and Fujairah there are some saline

marshland and creeks with mangroves.

The mainland coast and associated islands consist of recent sedimentary carbonates, the isolated offshore islands have a much older origin.

The south-west region of the country comprises extensive gravel plains with banks of aeolian sand piled up by the prevailing winds. In contrast to the white calcerous sand of the coast, these inland dunes are yellow or orange with iron oxide and quartzite grains. In the centre lies the Liwa region, with an east-west crescent of oasis hamlets and gardens stretching for some 90 km. The presence of a high water table at the base of the higher dunes led to the development of date-palm cultivation. Semi-mobile dunes are the dominant visual feature between Abu-Dhabi and Al Ain.

While the dunes become increasingly stable further north and inland of the coastal lowlands, they remain high in the east and actually abut onto the Hajjar Mountains at Shwayb.

The central desert region extends north beyond Dhaid and Falaj Al Moalla. There is greater vegetation cover than on the western dune plains. Remnants of Acacia forest occur between Shwayb and Al Hair, and inland of Jebel Ali, but the stands are becoming more scattered and individual trees are often in poor condition.



The Vegetation of the United Arab Emirates

The United Arab Emirates as a whole has an arid climate characterized by low rainfalls and high temperatures with a prolonged dry and hot summer.

The greatest vegetation diversity occurs in the northern mountains which constitute about 70% of the total species in U. A. E.. About 60% are of all the plant species are annuals. They germinate and flower soon after the first rain; generally from February to April. The perennial species generally flower from January to early May and some up to September and November.

The vegetation of U. A. E. comprises about 76 families, 335 genera and about 625 species of vascular plants (excluding cultivated species). The density in species is due to the unique phyto-geographical position of the U. A. E.; where the four phyto-geographical regions meet (Zohary 1973; Satchell 1978; Karim 1998).

The four phyto-geographical regions in the U. A. E. are: the Sahara-Arabian regions (or Sahara-Sindian); the Sudanian regions; the Irano-Turanians and few elements of Mediterranean regions; which create varied ecological conditions within a limited area, also contribute to the abundance in species.

The most common families in the U. A. E., are:

Fabaceae, Asteraceae, Chenopodiaceae, Asclepiadaceae, Brassicaceae, Caryophyllaceae, Boraginaceae, Zygophyllaceae, poaceae and Cyperaceae.

They cover the following regions:

1) Mountainous region – this region extends from Shaa'm and Dibba in the north-east to Hatta and Al-Ain in the south-east, (Fig 2). As one climbs a mountain the climate becomes colder. Mountains are often very interesting places to look for wild flowers. On the lower slopes the vegetation may be moorland. The tops of mountains are some of the wildest places in the U. A. E.; and their appearance is usually shaped by the forces of nature alone. They include e.g. *Capparis cartilaginea, Artemisia herba-alba, Cocculus pendulus, Ficus salicifolia, Moringa peregrina, Dodonaea angustifolia, Euphorbia larica Pulicaria glutinosa, and Teucrium stocksianum.*

2) Coastal region – includes two parts:

a) The western coastline extends the length of the country along the Arabian Gulf.

b) The eastern coast which extends from north-east towards south-east, along the Gulf of Oman.

There are many different coastal types, ranging from steep, rocky cliffs to sandy beaches. All are affected by the closeness of the sea which, when rough, throws up salt spray which can be blown a long way inland. Coastal areas are often very exposed to winds, which may blow constantly for much of the year. Not only does the wind influence the vegetation by carrying salt spray, it also stunts the growth of larger plants, such as shrubs or trees, except in sheltered spots. Salt absorbs moisture, so that when salt spray lands on leaves it can draw the water out of the leaf unless this is protected by a thick, waxy outer layer. For this reason the leaves of many coastal plants have a greyish waxy appearance. Plants growing in this region include e.g. *Halocnemum strobilaceum, Sporobolus spicatus, Limonium axillare, Halopeplis perfoliata, Suaeda vermiculata, Cressa cretica, Bienertia cycloptera, Astragalus vogelii and Sphaerocoma aucheri.*

3) Desert region - which includes:

- a) Western dunes plains
- b) Central desert

Western sand dunes are mounds of sand piled up by the wind. As the wind blows the grains of sand along the surface of a dune, its shape and position gradually change. Any plants which are to grow on this slowly moving surface must be able to grow up through the sand if they

are buried or must spread over the surface of the dune and avoid burial. Many sand dune plants have stolons by which they radiate out over the sand. Their growth helps to make the dunes more stable. As the amount of vegetation on a dune increases, so the sand is prevented from blowing away and the dune finally is prevented from blowing away and the dune becomes stable. The central desert is mostly flat plains with sandy gravelly soil.

Plants growing in this region include e.g.

a) *Cornulaca arabicus, Cyperus conglomeratus, Prosopis cineraria, Zizyphus spina-christi, Lasiurus indicus, Salvadora persica and Calligonum comosum.*

b) The central desert dominated by *Neurada procumbens, Savignya parviflora, Hammada elegans, Silene villosa, Arnebia hispidissima Heliotropium kotschy, and Cornulaca monochantha.*

4) Alluvial plains region – which runs westwards from the mountainous slopes until they meet central desert (includes Al-Ain district). They include e.g.

Leptadenia pyrotechnica, Calligonum comosum, Heliotropium calcareum, Hammada elegans, Calotropis procera, Prosopis cineraria, Acacia tortilis, Rhazya stricta, Cenchrus ciliaris, Medicago laciniata, Aerva javanica, Lycium shawii and Tephrosia apollinea.



List of Plant Family Names

ACANTHACEAE	MENISPERMACEAE
ALOEACEAE	MORACEAE
AMARANTHACEAE	MORINGACEAE
APOCYNACEAE	NYCTAGINACEAE
ASCLEPIADACEAE	OROBANCHACEAE
BORAGINACEAE	PLANTAGINACEAE
CAPPARACEAE	PLUMBAGINACEAE
CARYOPHYLLACEAE	POLYGONACEAE
CHENOPODIACEAE	PORTULACACEAE
COMPOSITAE	RESEDACEAE
CONVOLVULACEAE	RHAMNACEAE
CRUCIFERAE	RUBIACEAE
CUCURBITACEAE	RUTACEAE
CYNOMORIACEAE	SALVADORACEAE
CYPERACEAE	SCROPHULARIACEAE
EUPHORBIACEAE	SOLANACEAE
GERANIACEAE	TILIACEAE
GRAMINEAE	UMBELLIFERAE
JUNCACEAE	VERBENACEAE
LABIATAE	VIOLACEAE
LEGUMINOSAE	ZYGOPHYLLACEAE
MALVACEAE	