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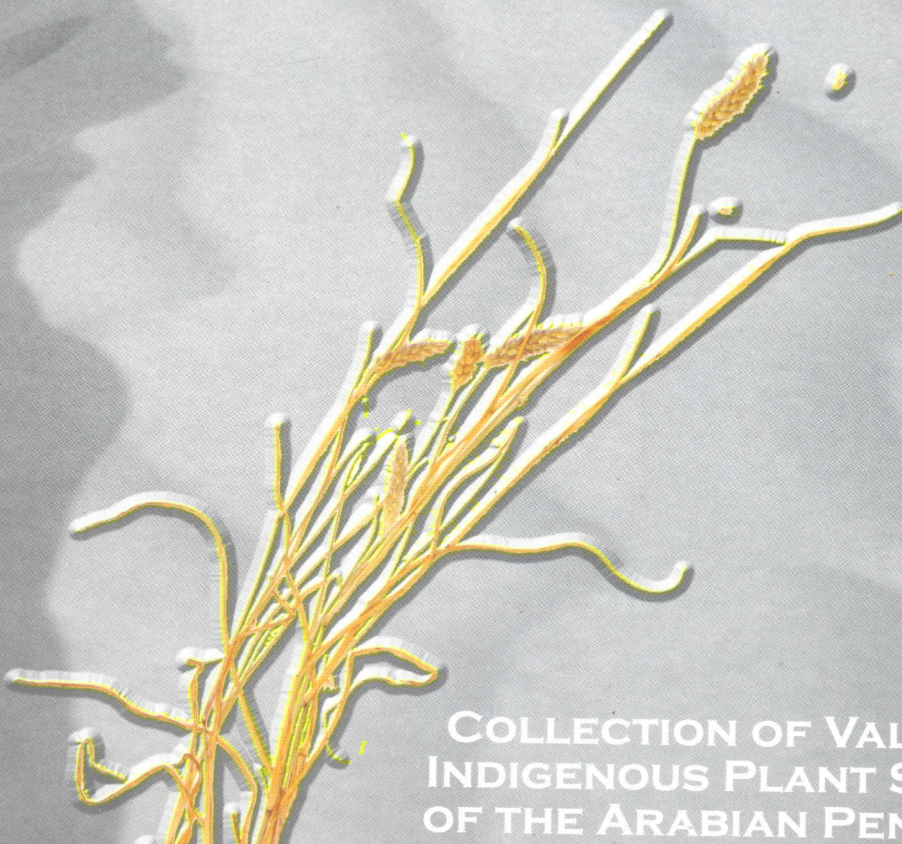
International Center for Agricultural Research in the Dry Areas (ICARDA)

Arabian Peninsula Regional Program (APRP)



COLLECTION OF VALUABLE INDIGENOUS PLANT SPECIES OF THE ARABIAN PENINSULA

1998-2004

AFESD

IFAD

OPEC Fund

About APRP, ICARDA and CGIAR

The Arabian Peninsula Regional Program (APRP) of ICARDA serves the seven countries of the Arabian Peninsula, namely, Bahrain, Kuwait, Qatar, Saudi Arabia, the Sultanate of Oman, the United Arab Emirates, and the Republic of Yemen. The Program addresses three priority themes (i) rangelands, forage and livestock; (ii) protected agriculture; and (iii) water resources management. These themes are supported by research in agroecological characterization and stress physiology. Emphasis is also placed on institutional strengthening and capacity building, human resource development, and promotion of the use of information technology. APRP is financially supported by the Arab Fund for Economic and Social Development (AFESD), the International Fund for Agricultural Development (IFAD), and, more recently, the OPEC Fund for International Development.

Established in 1977, the International Center for Agricultural Research in the Dry Areas (ICARDA) is one of 15 centers supported by the Consultative Group on International Agricultural Research (CGIAR). ICARDA serves the entire developing world for the improvement of lentil, barley and faba bean: all dry area developing countries for the improvement of on-farm water-use efficiency, rangeland and small-ruminant production; and in the West and Central Asia and North Africa (CWANA) region for the improvement of bread and the durum wheats, chickpea, and farming systems. ICARDA's research provides global benefits of poverty alleviation through productivity improvements integrated with sustainable natural-resource management practices. ICARD meets this challenge through research, training, and dissemination of information in partnership with the national, regional and international agricultural research and development systems.

The Consultative Group on International Agricultural Research (CGIAR) is a strategic alliance of countries, international and regional organizations, and private foundations supporting 15 international agricultural Centers that work with national agricultural research systems and civil society organizations including the private sector. The alliance mobilizes agricultural science to reduce poverty, foster human well being, promote agricultural growth and protect the environment. The CGIAR generates global public goods that are available to all.

The World Bank, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP), and the International Fund for Agricultural Development (IFAD) are cosponsors of the CGIAR. The World Bank provides the CGIAR with a System Office in Washington, DC. A Science Council, with its Secretariat at FAO in Rome, assists the System in the development of its research program.

Collection of Valuable Indigenous Plant Species of the Arabian Peninsula
1998-2004

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ICARDA

International Center for Agricultural Research in the Dry Areas

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Ahmed El Tayeb Osman

Foreword

The Arabian Peninsula (AP), which comprises seven countries – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates (UAE), and Yemen – is characterized by low and erratic rainfall, high evaporation rates, and high temperatures. Soil and water salinity is also high, and can increase rapidly as a result of irrigation with brackish water. Over the centuries, these extreme conditions have applied rigorous selection pressures on plant species, resulting in a uniquely adapted plant biodiversity. This resource of precious genes can play an important role in agricultural research globally.

However, the native plant biodiversity of the Peninsula is rapidly depleting. A large part of the total land area now suffers from some form of desertification. This is due primarily to overgrazing. Since the late 1960s the region has experienced a sharp increase in animal production as a result of improved veterinary services and subsidies that enable the purchase of processed feed and baled hay. In 1998, an estimated 24 million head of livestock, mainly sheep, goats and camels, were reported in the region.

Overgrazing reduces the productivity of ecosystems and changes the species relative abundance. Herbivores select and graze palatable species, leaving an ecosystem dominated by unpalatable and sometimes poisonous species. This phenomenon is seriously threatening the genetic resources and biodiversity of useful forage species, which were in the past, and could again be, the basis for sustainable animal production in the region.

The main approach used by ICARDA's Arabian Peninsula Regional Program (APRP) to address the problem of degraded rangelands, shortage of feed for livestock, and limited water for irrigated forages, lies in the utilization of adapted indigenous forage species. Collection missions were carried out with the national programs of different countries in the Peninsula. This publication documents the genetic materials collected in the region from 1998 to 2004, and provides passport data for those collections. Some of the species collected have been found to be valuable as forage crops with high water-use efficiency, a feature that is extremely useful in the dry areas.

I hope this publication will be useful for researchers, taxonomists, and range management specialists.

Prof. Dr Adel El-Beltagy
Director General, ICARDA

Introduction

The Arabian Peninsula (AP), which comprises seven countries – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates (UAE), and Yemen – experiences some of the most extreme climatic conditions, and has in recent years experienced large changes in human activities, which have implications for increased risk of land degradation and loss of plant biodiversity. These, together with a considerable loss of plant biodiversity of the Peninsula, have contributed to desertification in the region. Within these countries, there are diverse ecosystems, which encourage species diversity and are likely to reflect genetic variation within those species found across the ecosystems. In the context of sustainable agricultural production and arresting desertification, the most important on earth.

AP is characterized by low and erratic rainfall, high evaporation rates and extremely high temperatures. Soil and water salinity, are also high which can increase rapidly under irrigation. Over the centuries, these extreme conditions have placed stringent evolutionary selection pressures resulting in a uniquely adapted biodiversity, an expression of genetic variation. With increases in levels of soil and water salinity globally and changes brought about through global warming, adaptation to extreme environmental conditions will become even more critical for agriculture.

The native plant biodiversity of the Arabian Peninsula estimated to be over 3500 species is being rapidly depleted. Large areas of AP now suffer from some form of desertification. The primary cause is overgrazing. Since the late 1960's the region has experienced a sharp increase in animal production, a positive outcome of improved veterinary services and provision of subsidy that enables farmers to purchase processed feed and baled hay. In 1998, it was estimated that there were 24 million heads of livestock, comprised mainly of sheep, goats and camels.

Overgrazing lowers the productivity of these ecosystems and causes reduction in the nutritional value and relative abundance of plant species. Herbivores usually select and graze the palatable species, thus leaving an ecosystem dominated by unpalatable and sometimes poisonous species. This phenomenon is seriously threatening the genetic resources and biodiversity of useful forage species, which were in the past, and could again be, the basis for sustainable animal production in the region.

The main approach adopted by the Arabian Peninsula Regional Program (APRP) to address the problem of degraded rangelands, shortage of feed for livestock and limited water for irrigated forages lies in the utilization of adapted indigenous forage species. Collection missions were carried out in different countries of AP. This publication therefore documents these missions and the genetic materials collected. Special emphasis was given to the passport data, which would guide researchers, taxonomists and range management specialists on where to locate particular species.

The missions started by assessing the situation in the different countries of AP and preparing a questionnaire that was circulated and completed by the AP countries. Based on information from the questionnaire, we agreed that priority should be given to collection missions in the UAE, the Sultanate of Oman and the Republic of Yemen.

A major objective of the first two collection missions in the UAE and the Sultanate of Oman was the training of counterpart scientists from the Ministry of Agriculture and Fisheries, UAE, and the Directorate of Agricultural Research, Oman, in germplasm collection techniques. The training course for 12 scientists was held at the Natural History Museum and Desert Park, Sharjah, UAE, from 28 February to 4 March 1998. Following the training course, separate germplasm collection missions were carried out in the United Arab Emirates, the Sultanate of Oman and the Republic of Yemen for the major indigenous forage grasses, legumes, shrubs and trees of the region, with the ultimate objective of utilizing the most promising germplasm for degraded rangeland rehabilitation and for irrigated fodder production under systems requiring substantially less water than incurrent practice. Similar collection missions took place in Dhofar, Sultanate of Oman (2001), Bahrain (2002), Qatar (1998-2004) and Saudi Arabia (2002-03). The material collected in each mission is reported in the relevant section in the book.

Collection in the United Arab Emirates 1998

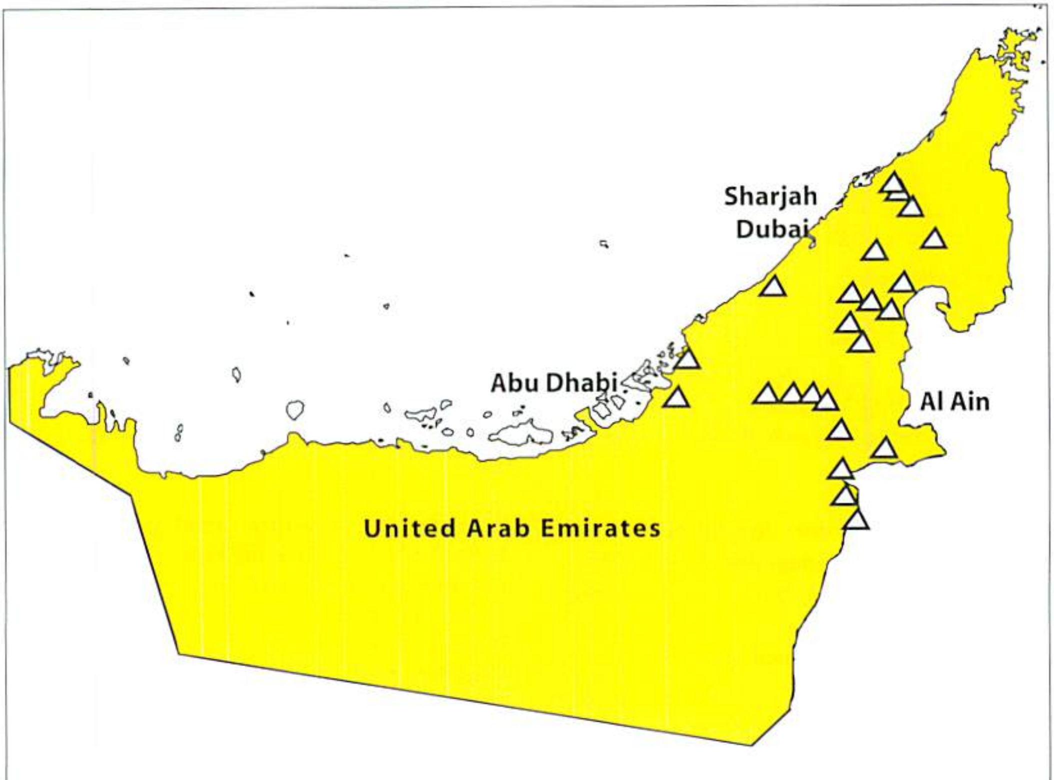

Plate 1 UAE - Calligonum crinitum

Genus: *Calligonum* **Family:** Polygonaceae
Species: *crinitum*
Sub-species: arabicum
Local name:
Collection date: 17 Mar.1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N23 40 826 **Longitude:** E55 33 929
Location: The first forest on right side on entering Wijan
Habitat: Protected or enclosed
Land form: Sand dune
Site description:
Dominant species:
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 1.9

Plate 2 UAE - Cassia italica

Genus: *Cassia* **Family:** Caesalpiniaceae
Species: *italica*
Sub-species:
Local name:
Collection date: 17 Mar.1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N23 43 178 **Longitude:** E55 33 848
Location: 16.7 km from Al-Arad on Al-Ain to Wijan road, on right
Habitat: Roadside
Land form: Sand dune
Site description:
Dominant species: *Indigofera oblongifolia* (?) (perennial legume, ashrek-davrah)
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sand
Species remarks: Many insects on seeds
Soil texture: Sand **Rock/stones:** No
pH: 8.1 **Ec:** 0.8

Plate 3-1 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N25 04 239 **Longitude:** E55 08 501
Location: At roundabout at entrance to Emirates Golf Club, turn right, continue for 2 km, turn left for 0.3 km on dirt track
Habitat: Communal grazing
Land form: Inland salt pan (sabkhah)
Site description:
Dominant species: *Pennisetum divisum, Panicum turgidum, Stipaprostis plumosa*
Grazing pressure: Low seed collected: Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 3.7

Plate 3-2 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 39 082 **Longitude:** E55 49 641
Location: 12 km from Hamraniyah in NW direction, towards Al-Jazirah a Hamra
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth (*Haloxylon salicornicum* ?), *Pennisetum divisum*
Grazing pressure: Medium seed collected: Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.3 **Ec:** 0.2

Plate 3-3 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Fujeirah
Latitude: N25 08 371 **Longitude:** E56 21 314
Location: In plot on North side of Hilton Hotel, Fujeirah
Habitat: Disturbed
Land form: Gravel plain
Site description: Wasteland area
Dominant species: Annual grasses
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sandy loam
Species remarks:
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.2 **Ec:** 0.4
Calcareous soil

Plate 3-4 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 21 920 **Longitude:** E56 00 768
Location: 6 km after turn to Ghayl on Ras Al Khaimah to Manama road on right
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: *Panicum turgidum, Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sand
Species remarks: Found within Ryza stricta
Soil texture: Sand **Rock/stones:** No
pH: 8.1 **Ec:** 0.2

Plate 3-5 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 32 814 **Longitude:** E56 53 718
Location: From roundabout at Ras Al Khaimah International Airport, turn towards airport, after 5 km at roundabout turn left, after 5.3 km turn right for 2.7 km in westerly direction
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth (*Haloxylon salicornicum* ?), *Panicum turgidum*
Grazing pressure: Medium seed collected; Y
Species distribution: Clumped
Species frequency: Rare
Soil texture: Sand
Species remarks: Much black fungal disease, possibly smut
Soil texture: Sand **Rock/stones:** No
pH: 8.1 **Ec:** 0.2

Plate 3-6 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 05 224 **Longitude:** E55 50 541
Location: Approximately 5 km on road from Mileiha to Al-Ain, turn right on desert track for 2 km in westerly direction towards the base of Jebel Fa'jyah
Habitat: Communal grazing
Land form: Sand dune
Site description: On small dunes at base of Jebel Fa'jyah
Dominant species: *Panicum turgidum, Pennisetum divisum,* annual grasses
Grazing pressure: High seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sand
Species remarks: Occurs within *Pennisetum divisum*
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 3-7 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 21 920 **Longitude:** E56 00 768
Location: 6 km after turn to Ghayl on Ras Al Khaimah to Manama road on right
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: *Panicum turgidum, Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sand
Species remarks: Found within Ryza stricta
Soil texture: Sand **Rock/stones:** No
pH: 8.1 **Ec:** 0.2

Plate 3-8 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum, Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 3-9 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 41 731 **Longitude:** E55 47 836
Location: On road from Ajman to Ras Al-Khaimah, 35 km on left from Umm Al-Qaiwain roundabout, opposite Majan Printing and Packaging Co.
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description:
Dominant species: Harim al Jamal
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 12
Calcareous soil

Plate 3-10 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N24 55 675 **Longitude:** E55 46 502
Location: On road from Madam to Dhaid, 1.5 km from Madam roundabout on left
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth and annual grasses
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.3 **Ec:** 0.3

Plate 3-11 UAE - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Sub-species:
Local name: leybid
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 51 876 **Longitude:** E55 33 432
Location: 2.5 km before Junction 8 on Dubai to Al-Ain road on right, by restaurant
Habitat: Roadside
Land form: Sand dune
Site description: Drip irrigation
Dominant species: Planted woodland of *Presopis cineraria*, Neem, Arak, also *Pennisetum divisum* and *Paniucum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.4

Plate 4-1 UAE - Coelachyrum piercei

Genus: *Coelachyrum* **Family:** Poaceae
Species: *piercei*
Sub-species:
Local name: dakhna
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 41 731 **Longitude:** E55 47 836
Location: On road from Ajman to Ras Al-Khaimah, 35 km on left from Umm Al-Qaiwain roundabout, opposite Majan Printing and Packaging Co.
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description:
Dominant species: Harim al Jamal
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 12
Calcareous soil

Plate 4-2 UAE - Coelachyrum piercei

Genus: *Coelachyrum* **Family:** Poaceae
Species: *piercei*
Sub-species:
Local name: dakhna
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 38 099 **Longitude:** E54 41 604
Location: 3.1 km from bridge on Abu-Dhabi to Al-Rahba, over bridge, straight across roundabout towards the sea
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description: Near Sea
Dominant species: *Panicum turgidum, Halopeplis perfoliata*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 8.3

Plate 4-3 UAE - Coelachyrum piercei

Genus: *Coelachyrum* **Family:** Poaceae
Species: *piercei*
Sub-species:
Local name: dakhna
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum, Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks: Under *Acacia tortilis* tree
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 4-4 UAE - Coelachyrum piercei

Genus: *Coelachyrum* **Family:** Poaceae
Species: *piercei*
Sub-species:
Local name: dakhna
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 39 082 **Longitude:** E55 49 641
Location: 12 km from Hamraniyah in NW direction, towards Al-Jazirah a Hamra
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth (*Haloxylon salicornicum* ?), *Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.3 **Ec:** 0.2

Plate 5-1 UAE - Dichanthium foveolatum

Genus: *Dichanthium* **Family:** Poaceae
Species: *foveolatum*
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N25 04 239 **Longitude:** E55 08 501
Location: At roundabout at entrance to Emirates Golf Club, turn right, continue for 2 km, turn left for 0.3 km on dirt track
Habitat: Communal grazing
Land form: Inland salt pan (sabkhah)
Site description:
Dominant species: *Pennisetum divisum, Panicum turgidum, Stipaprostis plumosa*
Grazing pressure: Low seed collected; Y
Species distribution:
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 3.7

Plate 5-2 UAE - Dichanthium foveolatum

Genus: *Dichanthium* **Family:** Poaceae
Species: *foveolatum*
Sub-species:
Local name:
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Fujeirah
Latitude: N25 08 371 **Longitude:** E56 21 314
Location: In plot on North side of Hilton Hotel, Fujeirah
Habitat: Disturbed
Land form: Gravel plain
Site description: Wasteland area
Dominant species: Annual grasses
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Abundant
Soil texture: Sandy loam
Species remarks:
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.2 **Ec:** 0.4
Calcareous soil

Plate 5-3 UAE - Dichanthium foveolatum

Genus: *Dichanthium* **Family:** Poaceae
Species: *foveolatum*
Sub-species:
Local name:
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 41 731 **Longitude:** E55 47 836
Location: On road from Ajman to Ras Al-Khaimah, 35 km on left from Umm Al-Qaiwain roundabout, opposite Majan Printing and Packaging Co.
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description:
Dominant species: Harim al Jamal
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 12
Calcareous soil

Plate 5-4 UAE - Dichanthium foveolatum

Genus: *Dichanthium* **Family:** Poaceae
Species: *foveolatum*
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 38 099 **Longitude:** E54 41 604
Location: 3.1 km from bridge on Abu-Dhabi to Al-Rahba, over bridge, straight across roundabout towards the sea
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description: Near sea
Dominant species: *Panicum turgidum, Halopeplis perfoliata*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 8.3

Plate 5-5 UAE - Dichanthium foveolatum

Genus: *Dichanthium* **Family:** Poaceae
Species: *foveolatum*
Sub-species:
Local name:
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 00 800 **Longitude:** E56 21 872
Location: From roundabout at entrance to Khor Khalba Nature Reserve, corss bridge and continue ahead for 200m
Habitat: Protected or enclosed
Land form: Sand dune
Site description: On spur at Khor Kalba
Dominant species: *Pennisetum divisum, Halopeplis perfoliata* ?(Rimram)
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sandy loam
Species remarks: Locks as if majority are still in flowering
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.1 **Ec:** 0.3

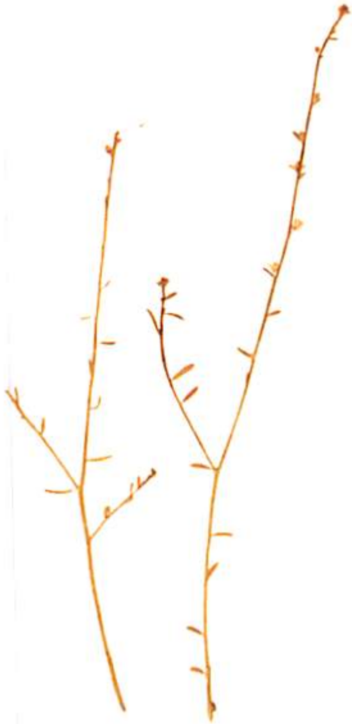

Plate 6-1 UAE - Dipterigium glaucum

Genus: *Dipterigium* **Family:** Capparaceae
Species: *glaucum*
Sub-species:
Local name: guthm
Collection date: 17 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N23 49 112 **Longitude:** E55 31 630
Location: 3.8 km from Al-Arad towards Al-Wijan on Al-Ain to Al-Wijan
Habitat: Roadside
Land form: Sand dune
Site description: Evidence of substantial runoff from road
Dominant species: *Dipterigium glaucum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks: Many green seeds
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 1.5

Plate 6-2 UAE - Dipterigium glaucum

Genus: *Dipterigium* **Family:** Capparaceae
Species: *glaucum*
Sub-species:
Local name: guthm
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Fujeirah
Latitude: N25 08 371 **Longitude:** E56 21 314
Location: In plot on North side of Hilton Hotel, Fujeirah
Habitat: Disturbed
Land form: Gravel plain
Site description: wasteland area
Dominant species: Annual grasses
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sandy loam
Species remarks:
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.2 **Ec:** 0.4
Calcareous soil

Plate 6-3 UAE - Dipterigium glaucum

Genus: *Dipterigium* **Family:** Capparaceae
Species: *glaucum*
Sub-species:
Local name: guthm
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum, Panicum turgidum*
Grazing pressure: None seed collected: Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks: Very few seeds
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 6-4 UAE - Dipterigium glaucum

Genus: *Dipterigium* **Family:** Capparaceae
Species: *glaucum*
Sub-species:
Local name: guthm
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 25 171 **Longitude:** E55 06 853
Location: 20.9 km from the Sweihan roundabout on the Sweihan to Abu-Dhabi road, on right
Habitat: Roadside
Land form: Gravel plain
Site description:
Dominant species: Harmel, *Pennisetum divisum* and *Panicum turgidum*
Grazing pressure: None seed collected: Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks: Few seeds, still flowering
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 1

Plate 6-5 UAE - Dipterigium glaucum

Genus: *Dipterigium* **Family:** Capparaceae
Species: *glaucum*
Sub-species:
Local name: guthm
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 51 876 **Longitude:** E55 33 432
Location: 2.5 km before Junction 8 on Dubai to Al-Ain road on right, by restaurant
Habitat: Roadside
Land form: Sand dune
Site description: Drip irrigation
Dominant species: Planted woodland of *Presopis cineraria,* Neem, Arak, also *Pennisetum divisum* and *Paniucum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks: Few seeds, still green
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.4

Plate 6-6 UAE - Dipterigium glaucum

Genus: *Dipterigium* **Family:** Capparaceae
Species: *glaucum*
Sub-species:
Local name: guthm
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Fujeirah
Latitude: N25 08 371 **Longitude:** E56 21 314
Location: In plot on North side of Hilton Hotel, Fujeirah
Habitat: Disturbed
Land form: Gravel plain
Site description: Wasteland area
Dominant species: Annual grasses
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sandy loam
Species remarks:
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.2 **Ec:** 0.4
Calcareous soil

Plate 6-7 UAE - Dipterigium glaucum

Genus: *Dipterigium* **Family:** Capparaceae
Species: *glaucum*
Sub-species:
Local name: guthm
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 44 405 **Longitude:** E55 36 883
Location: 4.8 km after Abu Dhabi/ Dubai border on Al-Ain to Dubai highway, on left
Habitat: Roadside
Land form: Sand dune
Site description: Drip irrigation and run-off from road
Dominant species: *Pennisetum divisum* and *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sand
Species remarks: Seeds still green
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 0.4

Plate 6-8 UAE - Dipterigium glaucum

Genus: *Dipterigium* **Family:** Capparaceae
Species: *glaucum*
Sub-species:
Local name: guthm
Collection date: 17 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N23 43 178 **Longitude:** E55 33 848
Location: 16.7 km from Al-Arad on Al-Ain to Wijan road, on right
Habitat: Roadside
Land form: Sand dune
Site description:
Dominant species: *Indigofera oblongifolia* (?) (perennial legume, ashrek-davrah)
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks: Seeds still green
Soil texture: Sand **Rock/stones:** No
pH: 8.1 **Ec:** 0.8

Plate 7 UAE - Farsetia aegyptiaca

Genus: *Farsetia* **Family:** Cruciferae
Species: *aegyptiaca*
Sub-species:
Local name:
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 26 313 **Longitude:** E55 14 722
Location: 6.8 km from Sweihan roundabout on the Sweihan to Abu-Dhabi road, on right
Habitat: Roadside
Land form: Gravel plain
Site description:
Dominant species: Harmel, *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency: Rare
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 2.7

Plate 8-1 UAE - Heliotropium kotschyi

Genus: *Heliotropium* **Family:** Boraginaceae
Species: *kotschyi*
Sub-species:
Local name:
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum, Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 8-2 UAE - Heliotropium kotschyi

Genus: *Heliotropium* **Family:** Boraginaceae
Species: *kotschyi*
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 38 099 **Longitude:** E54 41 604
Location: 3.1 km from bridge on Abu-Dhabi to Al-Rahba, over bridge, straight across roundabout towards the sea
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description: Near sea
Dominant species: *Panicum turgidum, Halopeplis perfoliata*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 8.3

Plate 9 UAE - Indigofera articulata

Genus: *Indigofera* **Family:** Fabaceae
Species: *articulata*
Sub-species:
Local name:
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 26 313 **Longitude:** E55 14 722
Location: 6.8 km from Sweihan roundabout on the Sweihan to Abu-Dhabi road, on right
Habitat: Roadside
Land form: Gravel plain
Site description:
Dominant species: Harmel, *Stipagrostis plumosa*
Grazing pressure: None seed collected: Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks: Many pods still appear green
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 2.7

Plate 10-1 UAE - Indigofera sp.

Genus: *Indigofera* **Family:** Fabaceae
Species:
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 38 099 **Longitude:** E54 41 604
Location: 3.1 km from bridge on Abu-Dhabi to Al-Rahba, over bridge, straight across roundabout towards the sea
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description: Near Sea
Dominant species: *Panicum turgidum, Halopeplis perfoliata*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 8.3

Plate 10-2 UAE - Indigofera sp.

Genus: *Indigofera* **Family:** Fabaceae
Species:
Sub-species:
Local name:
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum, Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 11-1 UAE - Lasiurus scindicus

Genus: *Lasiurus* **Family:** Poaceae
Species: *scindicus*
Sub-species:
Local name: Da'e
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 05 224 **Longitude:** E55 50 541
Location: Approximately 5 km on road from Mileiha to Al-Ain, turn right on desert track for 2 km in westerly direction towards the base of Jebel Fa'jyah
Habitat: Communal grazing
Land form: Sand dune
Site description: on small dunes at base of Jebel Fa'jyah
Dominant species: *Panicum turgidum*, *Pennisetum divisum*, annual grasses
Grazing pressure: High seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks: Many heads still immature
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 11-2 UAE - Lasiurus scindicus

Genus: *Lasiurus* **Family:** Poaceae
Species: *scindicus*
Sub-species:
Local name: Da'e
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 21 920 **Longitude:** E56 00 768
Location: 6 km after turn to Ghayl on Ras Al Khaimah to Manama road on right
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: *Panicum turgidum*, *Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.1 **Ec:** 0.2

Plate 11-3 UAE - Lasiurus scindicus

Genus: *Lasiurus* **Family:** Poaceae
Species: *scindicus*
Sub-species:
Local name: Da'e
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 25 171 **Longitude:** E55 06 853
Location: 20.9 km from the Sweihan roundabout on the Sweihan to Abu-Dhabi road, on right
Habitat: Roadside
Land form: Gravel plain
Site description:
Dominant species: Harmel, *Pennisetum divisum* and *Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 1

Plate 11-4 UAE - Lasiurus scindicus

Genus: *Lasiurus* **Family:** Poaceae
Species: *scindicus*
Sub-species:
Local name: Da'e
Collection date: 17 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N23 40 826 **Longitude:** E55 33 929
Location: The first forest on right side on entering Wijan
Habitat: Protected or enclosed
Land form: Sand dune
Site description:
Dominant species:
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 19

Plate 11-5 UAE - Lasiurus scindicus

Genus: *Lasiurus* **Family:** Poaceae
Species: *scindicus*
Sub-species:
Local name: Da'e
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 23 834 **Longitude:** E55 26 351
Location: National Avian Research Centre, Sweihan
Habitat: Protected or enclosed
Land form: Gravel plain
Site description:
Dominant species:
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.5 **Ec:** 3

Plate 11-6 UAE - Lasiurus scindicus

Genus: *Lasiurus* **Family:** Poaceae
Species: *scindicus*
Sub-species:
Local name: Da'e
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum, Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks: Not too many heads although quite a number of bushes. This may be due to lack of grazing
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 12 UAE - Leptadenia pyrotechnica

Genus: *Leptadenia* **Family:** Asclepiadaceae
Species: *pyrotechnica*
Sub-species:
Local name:
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum, Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks: Pods still green, milky exudate
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 13-1 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum, Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 13-2 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 44 405 **Longitude:** E55 36 883
Location: 4.8 km after Abu Dhabi/ Dubai border on Al-Ain to Dubai highway, on left
Habitat: Roadside
Land form: Sand dune
Site description: Drip irrigation and run-off from road
Dominant species: *Pennisetum divisum* and *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 0.4

Plate 13-3 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N25 01 659 **Longitude:** E55 33 952
Location: 4 km from Al-Haba on road from Al-Haba to Jebel Ali
Habitat: Roadside
Land form: Sand dune
Site description:
Dominant species: *Pennisetum divisum* and *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.4

Plate 13-4 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N25 04 239 **Longitude:** E55 08 501
Location: At roundabout at entrance to Emirates Golf Club, turn right, continue for 2 km, turn left for 0.3 km on dirt track
Habitat: Communal grazing
Land form: Inland salt pan (sabkhah)
Site description:
Dominant species: *Pennisetum divisum, Panicum turgidum, Stipagrostis plumosa*
Grazing pressure: Low seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 3.7

Plate 13-5 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 17 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N23 40 826 **Longitude:** E55 33 929
Location: The first forest on right side on entering Wijan
Habitat: Protected or enclosed
Land form: Sand dune
Site description:
Dominant species:
Grazing pressure: Seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 1.9

Plate 13-6 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 24 550 **Longitude:** E54 38 134
Location: 1.4 km before roundabout to Abu-Dhabi freight terminal on Abu-Dhabi to Dubai road
Habitat: Roadside
Land form: Sand dune
Site description: Irrigation in planted forest along road
Dominant species: Date palm, Neem, *Panicum turgidum*, *Sporobolus spicatus*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks: Many still flowering
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 5.8

Plate 13-7 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 39 082 **Longitude:** E55 49 641
Location: 12 km from Hamraniyah in NW direction, towards Al-Jazirah a Hamra
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth (*Haloxylon salicornicum* ?), *Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.3 **Ec:** 0.2

Plate 13-8 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 05 224 **Longitude:** E55 50 541
Location: Approximately 5 km on road from Mileiha to Al-Ain, turn right on desert track for 2 km in westerly direction towards the base of Jebel Fa'jyah
Habitat: Communal grazing
Land form: Sand dune
Site description: on small dunes at base of Jebel Fa'jyah
Dominant species: *Panicum turgidum*, *Pennisetum divisum*, annual grasses
Grazing pressure: High seed collected: Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks: Only a little seed as the camels appear to have eaten much of it
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

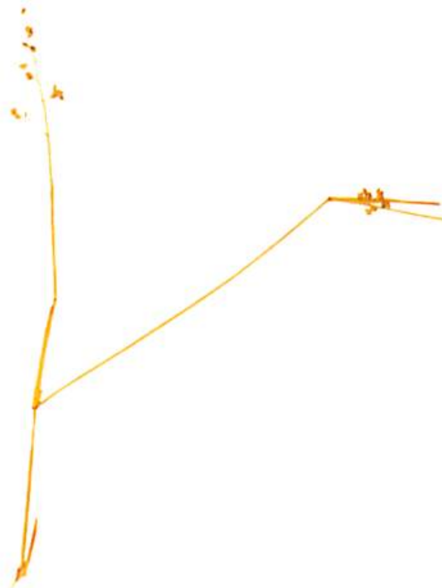

Plate 13-9 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 41 731 **Longitude:** E55 47 836
Location: On road from Ajman to Ras Al-Khaimah, 35 km on left from Umm Al-Qaiwain roundabout, opposite Majan Printing and Packaging Co.
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description:
Dominant species: Harim al Jamal
Grazing pressure: None seed collected: Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks: Many plants with no heads
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 12
Calcareous soil

Plate 13-10 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 21 920 **Longitude:** E56 00 768
Location: 6 km after turn to Ghayl on Ras Al Khaimah to Manama road on right
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: *Panicum turgidum*, *Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.1 **Ec:** 0.2

Plate 13-11 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 32 814 **Longitude:** E55 53 718
Location: From roundabout at Ras Al Khaimah International Airport, turn towards airport, after 5 km at roundabout turn left, After 5.3 km turn right for 2.7 km in westerly direction
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth (*Haloxylon salicornicum* ?), *Panicum turgidum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.2

Plate 13-12 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 24 550 **Longitude:** E54 38 134
Location: 1.4 km before roundabout to Abu-Dhabi freight terminal on Abu-Dhabi to Dubai road
Habitat: Roadside
Land form: Sand dune
Site description: Irrigation in planted forest along road
Dominant species: Date palm, Neem, *Panicum turgidum, Sporobolus spicatus*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks: Many still flowering
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 5.8

Plate 13-13 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 21 920 **Longitude:** E56 00 768
Location: 6 km after turn to Ghayl on Ras Al Khaimah to Manama road on right
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: *Panicum turgidum, Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.1 **Ec:** 0.2

Plate 13-14 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 51 876 **Longitude:** E55 33 432
Location: 2.5 km before Junction 8 on Dubai to Al-Ain road on right, by restaurant
Habitat: Roadside
Land form: Sand dune
Site description: Drip irrigation
Dominant species: Planted woodland of *Presopis cineraria*, Neem, Arak, also *Pennisetum divisum* and *Paniucum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.4

Plate 13-15 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 25 171 **Longitude:** E55 06 853
Location: 20.9 km from the Sweihan roundabout on the Sweihan to Abu-Dhabi road, on right
Habitat: Roadside
Land form: Gravel plain
Site description:
Dominant species: Harmel, *Pennisetum divisum* and *Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 1

Plate 13-16 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 26 269 **Longitude:** E55 21 346
Location: 29.1 km from the turn to Sweihan on the on the Abu-Dhabi to Al-Ain road, towards Sweihan, on right
Habitat: Roadside
Land form: Sand dune
Site description:
Dominant species: *Pennisetum divisum*, rimth, *Cyperus conglomeratus*
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 0.9

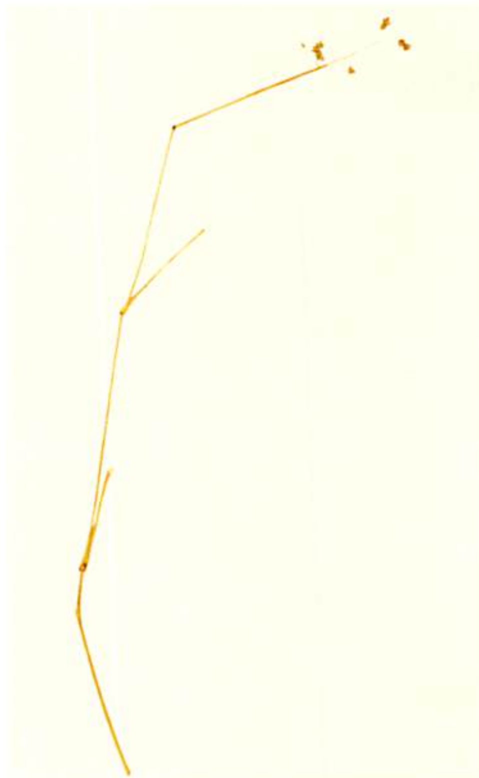

Plate 13-17 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 38 099 **Longitude:** E55 41 604
Location: 3.1 km from bridge on Abu-Dhabi to Al-Rahba, over bridge, straight across roundabout towards the sea
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description: Near Sea
Dominant species: *Panicum turgidum, Halopeplis perfoliata*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 8.3

Plate 13-8 UAE - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Sub-species:
Local name: thomam
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 51 876 **Longitude:** E55 33 432
Location: 2.5 km before Junction 8 on Dubai to Al-Ain road on right, by restaurant
Habitat: Roadside
Land form: Sand dune
Site description: Drip irrigation
Dominant species: Planted woodland of *Presopis cineraria*, Neem, Arak, also *Pennisetum divisum* and *Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.4

Plate 14-1 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 25 171 **Longitude:** E55 06 853
Location: 20.9 km from the Sweihan roundabout on the Sweihan to Abu-Dhabi road, on right
Habitat: Roadside
Land form: Gravel plain
Site description:
Dominant species: Harmel, *Pennisetum divisum* and *Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 1

Plate 14-2 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 26 269 **Longitude:** E55 21 346
Location: 29.1 km from the turn to Sweihan on the Abu-Dhabi to Al-Ain road, towards Sweihan, on the right
Habitat: Roadside
Land form: Sand dune
Site description:
Dominant species: *Pennisetum divisum*, rimth, *Cyperus conglomeratus*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 0.9

Plate 14-3 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 39 082 **Longitude:** E55 49 641
Location: 12 km from Hamraniyah in NW direction, towards Al-Jazirah a Hamra
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth (*Haloxylon salicornicum* ?), *Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.3 **Ec:** 0.2

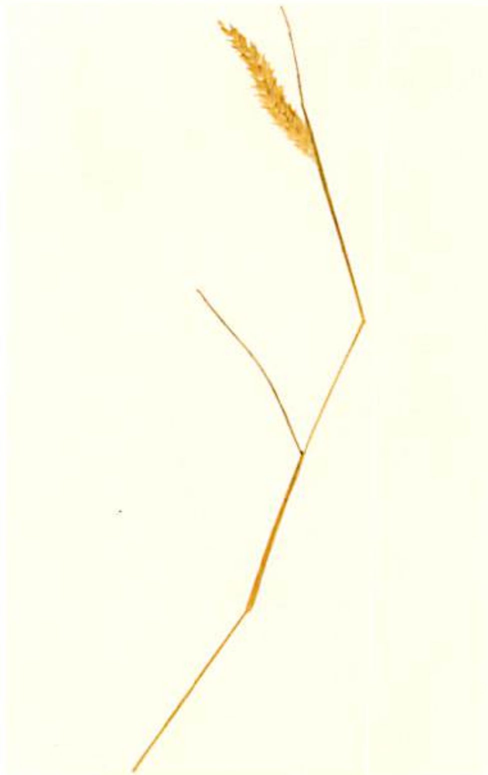

Plate 14-4 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 32 814 **Longitude:** E55 53 718
Location: From roundabout at Ras Al Khaimah International Airport, turn towards airport, after 5 km at roundabout turn left, After 5.3 km turn right for 2.7 km in westerly direction
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth (*Haloxylon salicornicum* ?), *Panicum turgidum*
Grazing pressure: Medium seed collected; Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.2

Plate 14-5 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 21 920 **Longitude:** E56 00 768
Location: 6 km after turn to Ghayl on Ras Al Khaimah to Manama road on right
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: *Panicum turgidum*, *Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.1 **Ec:** 0.2

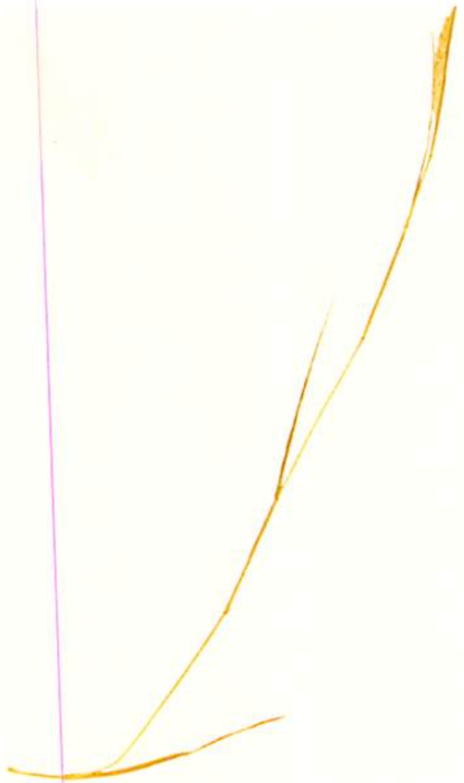

Plate 14-6 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 00 800 **Longitude:** E56 21 872
Location: From roundabout at entrance to Khor Khalba Nature Reserve, cross bridge and continue ahead for 200m
Habitat: Protected or enclosed
Land form: Sand dune
Site description: On spur at Khor Kalba
Dominant species: *Pennisetum divisum, Halopeplis perfoliata* ?(Rimram)
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sandy loam
Species remarks: Not many heads, majority immature
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.1 **Ec:** 0.3

Plate 14-7 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N25 01 659 **Longitude:** E55 33 952
Location: 4 km from Al-Haba on road from Al-Haba to Jebel Ali
Habitat: Roadside
Land form: Sand dune
Site description:
Dominant species: *Pennisetum divisum* and *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.4

Plate 14-8 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 51 876 **Longitude:** E55 33 432
Location: 2.5 km before Junction 8 on Dubai to Al-Ain road on right, by restaurant
Habitat: Roadside
Land form: Sand dune
Site description: Drip irrigation
Dominant species: Planted woodland of *Presopis cineraria*, Neem, Arak, also *Pennisetum divisum* and *Paniucum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.4

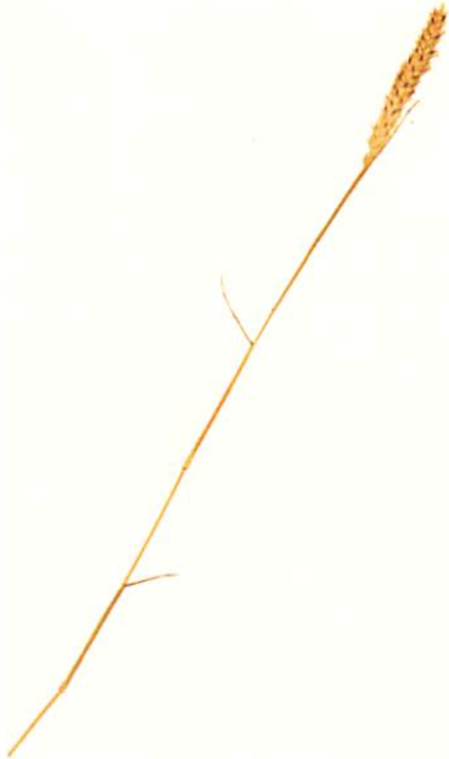

Plate 14-9 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 39 082 **Longitude:** E55 49 641
Location: 12 km from Hamraniyah in NW direction, towards Al-Jazirah a Hamra
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth (*Haloxylon salicornicum* ?), *Pennisetum divisum*
Grazing pressure: Medium seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.3 **Ec:** 0.2

Plate 14-10 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 05 224 **Longitude:** E55 50 541
Location: Approximately 5 km on road from Mileiha to Al-Ain, turn right on desert track for 2 km in westerly direction towards the base of Jebel Fa'jyah
Habitat: Communal grazing
Land form: Sand dune
Site description: on small dunes at base of Jebel Fa'jyah
Dominant species: *Panicum turgidum*, *Pennisetum divisum*, annual grasses
Grazing pressure: High Seed collected: Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks: Grows on sand dunes
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 14-11 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 59 285 **Longitude:** E55 40 235
Location: 13.5 km from Madam roundabout on road to Dubai, both sides of the road
Habitat: Roadside
Land form: Sand dune
Site description:
Dominant species: *Stipagrostis plumosa* and *Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.3 **Ec:** 0.3

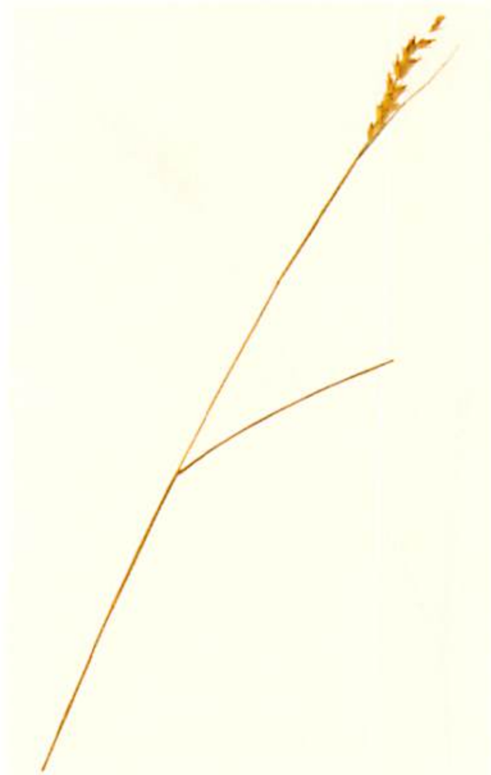

Plate 14-12 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 26 313 **Longitude:** E55 14 722
Location: 6.8 km from Sweihan roundabout on the Sweihan to Abu-Dhabi road, on right
Habitat: Roadside
Land form: Gravel plain
Site description:
Dominant species: Harmel, *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 2.7

Plate 14-13 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N25 04 239 **Longitude:** E55 08 501
Location: At roundabout at entrance to Emirates Golf Club, turn right, continue for 2 km, turn left for 0.3 km on dirt track
Habitat: Communal grazing
Land form: Inland salt pan (sabkhah)
Site description:
Dominant species: *Pennisetum divisum, Panicum turgidum, Stipagrostis plumosa*
Grazing pressure: Low seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 3.7

Plate 14-14 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N24 55 675 **Longitude:** E55 46 502
Location: On road from Madam to Dhaid, 1.5 km from Madam roundabout on left
Habitat: Communal grazing
Land form: Sand dune
Site description:
Dominant species: Rimth and annual grasses
Grazing pressure: Medium seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.3 **Ec:** 0.3

Plate 14-15 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 00 800 **Longitude:** E56 21 872
Location: From roundabout at entrance to Khor Khalba Nature Reserve, cross bridge and continue ahead for 200m
Habitat: Protected or enclosed
Land form: Sand dune
Site description: On spur at Khor Kalba
Dominant species: *Pennisetum divisum*, *Halopeplis perfoliata* ?(Rimram)
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sandy loam
Species remarks: Not many heads, majority immature
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.1 **Ec:** 0.3

Plate 14-16 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From roundabout at entrance to Khor Khalba Nature Reserve, cross bridge and continue ahead for 200m
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum*, *Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 14-17 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 17 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N23 40 826 **Longitude:** E55 33 929
Location: The first forest on right side on entering Wijan
Habitat: Protected or enclosed
Land form: Sand dune
Site description:
Dominant species:
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 19

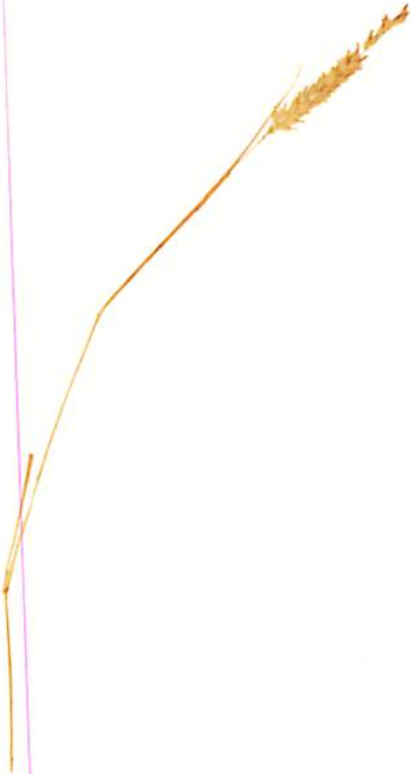

Plate 14-18 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 44 405 **Longitude:** E55 36 883
Location: 4.8 km after Abu Dhabi/ Dubai border on Al-Ain to Dubai highway, on left
Habitat: Roadside
Land form: Sand dune
Site description: Drip irrigation and run-off from road
Dominant species: *Pennisetum divisum* and *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks: Only on sand dune
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 0.4

Plate 14-19 UAE - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Sub-species:
Local name: sabat
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 12 692 **Longitude:** E55 30 112
Location: 3.8 km after Sweihan turn on Al-Ain to Abu-Dhabi road, just before police station on left
Habitat: Roadside
Land form: Sand dune
Site description: Irrigated trees beside road
Dominant species: *Pennisetum divisum*, *Sporobolus spicatus*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 8.1

Plate 15 UAE - Rhanterium eppaposum

Genus: *Rhanterium* **Family:** Compositae
Species: *eppaposum*
Sub-species:
Local name:
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dune
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum, Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 16 UAE - Savignya parviflora

Genus: *Savignya* **Family:** Cruciferae
Species: *parviflora*
Sub-species:
Local name:
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 26 313 **Longitude:** E55 14 722
Location: 6.8 km from Sweihan roundabout on the Sweihan to Abu-Dhabi road, on right
Habitat: Roadside
Land form: Gravel plain
Site description:
Dominant species: Harmel, *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 2.7

Plate 17-1 UAE - Sphaerocoma aucheri

Genus: *Sphaerocoma* **Family:** Caryophyllaceae
Species: *aucheri*
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 38 099 **Longitude:** E54 41 604
Location: 3.1 km from bridge on Abu-Dhabi to Al-Rahba, over bridge, straight across roundabout towards the sea
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description: Near sea
Dominant species: *Panicum turgidum, Halopeplis perfoliata*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 8.3

Plate 17-2 UAE - Sphaerocoma aucheri

Genus: *Sphaerocoma* **Family:** Caryophyllaceae
Species: *aucheri*
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N25 04 239 **Longitude:** E55 08 501
Location: At roundabout at entrance to Emirates Golf Club, turn right, continue for 2 km, turn left for 0.3 km on dirt track
Habitat: Communal grazing
Land form: Inland salt pan (sabkhah)
Site description:
Dominant species: *Pennisetum divisum, Panicum turgidum, Stipagrostis plumosa*
Grazing pressure: Low seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 3.7

Plate 18-1 UAE - Sporobolus ioclades

Genus: *Sporobolus* **Family:** Poaceae
Species: *ioclades*
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N25 04 239 **Longitude:** E55 08 501
Location: At roundabout at entrance to Emirates Golf Club, turn right, continue for 2 km, turn left for 0.3 km on dirt track
Habitat: Communal grazing
Land form: Inland salt pan (sabkhah)
Site description:
Dominant species: *Pennisetum divisum, Panicum turgidum, Stipagrostis plumosa*
Grazing pressure: Low seed collected; Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 3.7

Plate 18-2 UAE - Sporobolus ioclades

Genus: *Sporobolus* **Family:** Poaceae
Species: *ioclades*
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 38 099 **Longitude:** E54 41 604
Location: 3.1 km from bridge on Abu-Dhabi to Al-Rahba, over bridge, straight across roundabout towards the sea
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description: Near sea
Dominant species: *Panicum turgidum, Halopeplis perfoliata*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 8.3

Plate 19-1 UAE - Sporobolus spicatus

Genus: *Sporobolus* **Family:** Poaceae
Species: *spicatus*
Sub-species:
Local name:
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Fujeirah
Latitude: N25 08 371 **Longitude:** E56 21 314
Location: In plot on North side of Hilton Hotel, Fujeirah
Habitat: Disturbed
Land form: Gravel plain
Site description: wasteland area
Dominant species: Annual grasses
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Occasional
Soil texture: Sandy loam
Species remarks: against wall
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.2 **Ec:** 0.4
Calcareous soil

Plate 19-2 UAE - Sporobolus spicatus

Genus: *Sporobolus* **Family:** Poaceae
Species: *spicatus*
Sub-species:
Local name:
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 12 692 **Longitude:** E55 30 112
Location: 3.8 km after Sweihan turn on Al-Ain to Abu-Dhabi road, just before police station on left
Habitat: Roadside
Land form: Sand dune
Site description: Irrigated trees beside road
Dominant species: *Pennisetum divisum*, *Sporobolus spicatus*
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks: Found near irrigation points
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 8.1

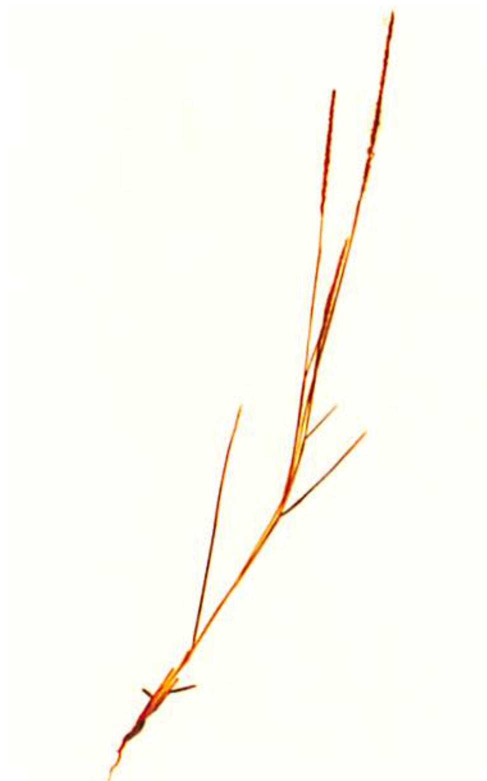

Plate 19-3 UAE - Sporobolus spicatus

Genus: *Sporobolus* **Family:** Poaceae
Species: *spicatus*
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 24 550 **Longitude:** E54 38 134
Location: 1.4 km before roundabout to Abu-Dhabi freight terminal on Abu-Dhabi to Dubai road
Habitat: Roadside
Land form: Sand dune
Site description: Irrigation in planted forest along road
Dominant species: Date palm, Neem, *Panicum turgidum*, *Sporobolus spicatus*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 5.8

Plate 19-4 UAE - Sporobolus spicatus

Genus: *Sporobolus* **Family:** Poaceae
Species: *spicatus*
Sub-species:
Local name:
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 44 405 **Longitude:** E55 36 883
Location: 4.8 km after Abu Dhabi/ Dubai border on Al-Ain to Dubai highway, on left
Habitat: Roadside
Land form: Sand dune
Site description: Drip irrigation and run-off from road
Dominant species: *Pennisetum divisum* and *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency: Rare
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 0.4

Plate 19-5 UAE - Sporobolus spicatus

Genus: *Sporobolus* **Family:** Poaceae
Species: *spicatus*
Sub-species:
Local name:
Collection date: 15 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Ras Al Khaimah
Latitude: N25 41 731 **Longitude:** E55 47 836
Location: On road from Ajman to Ras Al-Khaimah, 35 km on left from Umm Al-Qaiwain roundabout, opposite Majan Printing and Packaging Co.
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description:
Dominant species: Harim al Jamal
Grazing pressure: None seed collected; Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks: Appears very salt tolerant
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 12
Calcareous soil

Plate 20-1aUAE - Stipagrostis sp.

Genus: *Stipagrostis* **Family:** Poaceae
Species:
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 38 099 **Longitude:** E54 41 604
Location: 3.5 km from bridge on Abu-Dhabi to Al-Rahba, over bridge, straight across roundabout towards the sea
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description: Near sea
Dominant species: *Panicum turgidum*, *Halopeplis perfoliata*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 8.3

Plate 20-1b UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 38 099 **Longitude:** E54 41 604
Location: 3.5 km from bridge on Abu-Dhabi to Al-Rahba, over bridge, straight across roundabout towards the sea
Habitat: Coastal
Land form: Coastal salt pan (sabkhah)
Site description: Near sea
Dominant species: *Panicum turgidum, Halopeplis perfoliata*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 8.3

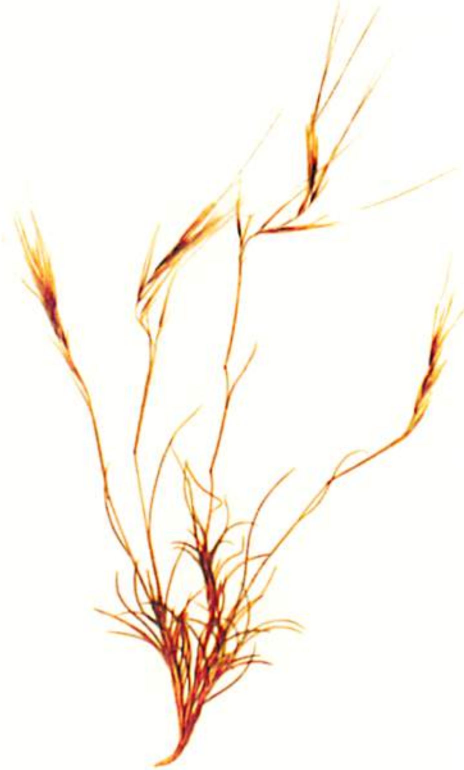

Plate 20-2 UAE - Stipagrostis sp.

Genus: *Stipagrostis* **Family:** Poaceae
Species:
Sub-species:
Local name:
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 23 834 **Longitude:** E55 26 351
Location: National Avian Research Centre, Sweihan
Habitat: Protected or enclosed
Land form: Gravel plain
Site description:
Dominant species:
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.5 **Ec:** 3

Plate 20-3 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 51 876 **Longitude:** E55 33 432
Location: 2.5 km before Junction 8 on Dubai to Al-Ain road on right, by restaurant
Habitat: Roadside
Land form: Sand dume
Site description: Drip irrigation
Dominant species: Planted woodland of *Presopis cineraria*, Neem, Arak, also *Pennisetum divisum* and *Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.4

Plate 20-4 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 59 285 **Longitude:** E55 40 235
Location: 13.5 km from Madam roundabout on road to Dubai, both sides of the road
Habitat: Roadside
Land form: Sand dume
Site description:
Dominant species: *Stipagrostis plumosa* and *Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.3 **Ec:** 0.3

Plate 20-5 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 01 659 **Longitude:** E55 33 952
Location: 4 km from Al-Haba on road from Al-Haba to Jebel Ali
Habitat: Roadside
Land form: Sand dume
Site description:
Dominant species: *Pennisetum divisum* and *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.4

Plate 20-6 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name:
Collection date: 19 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N25 04 239 **Longitude:** E55 08 501
Location: At roundabout at entrance to Emirates Golf Club, turn right, continue for 2 km, turn left for 0.3 km on dirt track
Habitat: Communal grazing
Land form: Inland salt pan (Sabkhah)
Site description:
Dominant species: *Pennisetum divisum* and *Stipagrostis plumosa*
Grazing pressure: Low seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 3.7

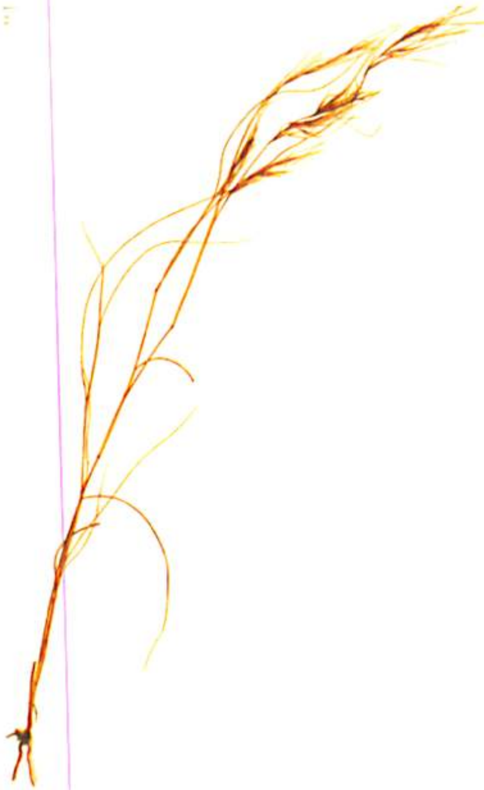

Plate 20-7 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 12 692 **Longitude:** E55 30 112
Location: 3.8 km after Sweihan turn on Al-Ain to Abu-Dhabi road, just before police station on left
Habitat: Roadside
Land form: Sand dume
Site description: Irrigated trees beside road
Dominant species: *Pennisetum divisum*, *Sporobolus spicatus*
Grazing pressure: None seed collected: Y
Species distribution: Clumped
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8 **Ec:** 8.1

Plate 20-8 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N24 00 800 **Longitude:** E56 21 872
Location: From roundabout at entrance to Khor Khalba Nature Reserve, cross bridge and continue ahead for 200m
Habitat: Protected or enclosed
Land form: Sand dume
Site description: On spur at Khor Kalba
Dominant species: *Pennisetum divisum*, *Halopeplis perfoliata* ?(Rimram)
Grazing pressure: None seed collected: Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sandy loam
Species remarks: small plants
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.1 **Ec:** 0.3

Plate 20-9 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 00 800 **Longitude:** E56 21 872
Location: From roundabout at entrance to Khor Khalba Nature Reserve, cross bridge and continue ahead for 200m
Habitat: Protected or enclosed
Land form: Sand dume
Site description: On spur at Khor Kalba
Dominant species: *Pennisetum divisum, Halopeplis perfoliata* ?(Rimram)
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sandy loam
Species remarks: small plants
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.1 **Ec:** 0.3

Plate 20-10 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 16 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Dubai
Latitude: N24 44 405 **Longitude:** E55 36 883
Location: 4.8 km after Abu Dhabi/ Dubai border on Al-Ain to Dubai highway, on left
Habitat: Roadside
Land form: Sand dume
Site description: Drip irrigation and run-off from road
Dominant species: *Pennisetum divisum, Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.9 **Ec:** 0.4

Plate 20-11 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 00 800 **Longitude:** E56 21 872
Location: From roundabout at entrance to Khor Khalba Nature Reserve, cross bridge and continue ahead for 200m
Habitat: Protected or enclosed
Land form: Sand dume
Site description: On spur at Khor Kalba
Dominant species: *Pennisetum divisum*, *Halopeplis perfoliata*? (Rimram)
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Occasional
Soil texture: Sandy loam
Species remarks: small plants
Soil texture: Sandy loam **Rock/stones:** No
pH: 8.1 **Ec:** 0.3

Plate 20-12 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 14 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Sharjah
Latitude: N25 17 146 **Longitude:** E55 41 712
Location: From entrance of Natural History Museum turn right and walk 200m along fence
Habitat: Protected or enclosed
Land form: Sand dume
Site description: Protected for 6 years
Dominant species: *Pennisetum divisum*, *Panicum turgidum*
Grazing pressure: None seed collected; Y
Species distribution:
Species frequency:
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 8.2 **Ec:** 0.3

Plate 20-13 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 26 313 **Longitude:** E55 14 722
Location: 6.8 km from Sweihan roundabout on the Sweihan to Abu-Dhabi road, on right
Habitat: Roadside
Land form: Gravel plain
Site description:
Dominant species: Harmel, *Stipagrostis plumosa*
Grazing pressure: None seed collected; Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.8 **Ec:** 2.7

Plate 20-14 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 17 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N23 58 026 **Longitude:** E55 30 769
Location: 15 km before Al-Arad on Al-Ain to Wijan road
Habitat: Roadside
Land form: Sand dume
Site description:
Dominant species: Harmel, *Stipagrostis plumosa*
Grazing pressure: Low seed collected; Y
Species distribution: Even
Species frequency: Frequent
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.7 **Ec:** 1.3

Plate 20-15 UAE - Stipagrostis plumosa

Genus: *Stipagrostis* **Family:** Poaceae
Species: *plumosa*
Sub-species:
Local name: nussie
Collection date: 18 Mar. 1998
Collectors: Morag Ferguson, Rashed Al-Hantoby and Ali Al-Mahrzy

Country: UAE **Province:** Abu Dhabi
Latitude: N24 23 834 **Longitude:** E55 26 351
Location: National Avian Research Centre, Sweihan
Habitat: Protected or enclosed
Land form: Gravel plain
Site description:
Dominant species:
Grazing pressure: None seed collected: Y
Species distribution: Even
Species frequency: Abundant
Soil texture: Sand
Species remarks:
Soil texture: Sand **Rock/stones:** No
pH: 7.5 **Ec:** 3

Collection in the Sultanate of Oman 1998

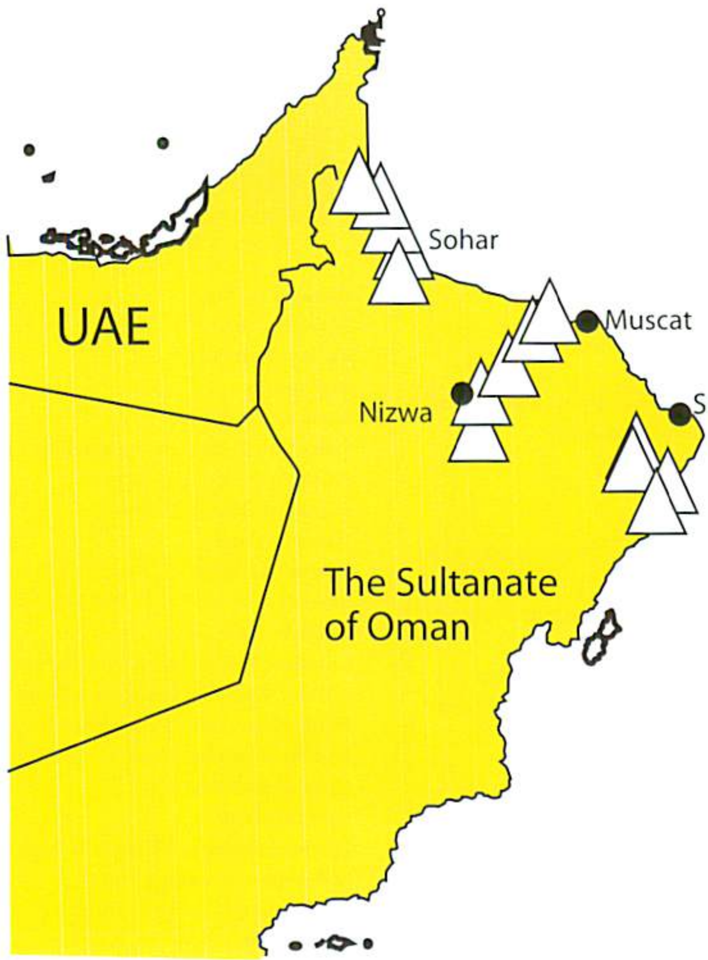

Plate 183 North-Oman - Asphodelus tenuifolius

Genus: *Asphodelus*
Species: *tenuifolius*
Family: Liliaceae
Local name: besala
Collector (s): Morag Ferguson, Saif Al -kutaiti, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 3/23/1998
Country: Oman
Region: Al-Batina
Sites: N24 18 749, E56 42 799; N24 27 534, E56 37 661
Altitude: 20 m; 10 m
Location: 4 km from Wadi Hibi rounabout in Sofar; 2 km from Majees roundabout towards jetty.
Habitat/Site: Disturbed roadside; protected area
Dominant species: annual grasses and *Aerva javanica*
Grazing pressure: Low to none
Seed collected: Y
Species frequency: Rare to frequent
Species remarks: only eaten when dry, found under the shade of *Acacia tortilis*
Soil texture: Gravel to sandy loan
Depth: Shallow < 0.5 m to Deep > 2 m
Parent rock: Aluvium or Calcareous
Slope: Level <2%
Landform: Alluvial pan; Coastal sandy loam

Plate 178 North-Oman - Cenchrus ciliaris

Genus: *Cenchrus*
Species: *ciliaris*
Family: Poaceae
Sub-species:
Local name: khodoor
Collector (s): Morag Ferguson, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 3/23/1998
Country: Oman
Region: Al-Batina
Sites: N24 20 89, E56 43 499; N24 18 749, E56 42 799
Altitude: 20 m; 20 m
Location: Directorate of Agriculture & Fisheries Nursery at Sofar; Wadi Hibi rounabout in Sofar
Habitat/Site: Farm; Disturbed roadside
Dominant species: annual grasses and *Aerva javanica*
Grazing pressure: Low
Seed collected: N; Y
Species frequency: Abundant in Wadi Hibi Site
Soil texture: Stones-ve; gravel
Depth: >2 m ; < 0.5 m
Parent rock: Calcareous; Aluvium
Slope: Level <2%
Landform: Farm land; Alluvial pan

Plate 178 North-Oman - Cenchrus ciliaris

Genus: *Cenchrus*
Species: *ciliaris*
Family: Poaceae
Local name:
Collector (s): Morag Ferguson, Saif Al -kutaiti, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 3/24/1998
Country: Oman
Region: Al-Batina
Sites: N24 27 534, E56 37 661; N22 17 752, E59 09 231
Altitude: 10 m; 150 m
Location: 2 km from Majees roundabout towards jetty on right in Majees Forest Farm 2; Wadi Al Ayn (First Wadi after leaving Kamil on Muscat Rd)
Habitat/Site: Protected or enclosed (protected for 8 years. Irrigated forest; Communal grazing land
Dominant species: *Panicum turgidum* and *Lasiurus scindicus*
Grazing pressure: None; low
Seed collected: Y
Species remarks: Most of seed shatteredin Wadi Al Ayn Site
Species frequency: Abundant
Soil texture: Sandy loam
Depth: Deep >2m; Shallow <0.5m
Parent rock: Calcareous
Slope: Level <2%
Landform: Coastal sandy loam; Alluvial pan

Plate 246 North-Oman - Colligonum comosum

Genus: *Colligonum*
Species: *comosum*
Family: Polygonaceae
Sub-species:
Local name: arta
Collector (s): Morag Ferguson, Safa'a Al-Farisi, Khalifa, Suleiman Canender, R. Sharma and Saed Al-Alawi
Collection date: 3/31/1998
Country: Oman
Region: Al-Batina
Latitude: N22 10 331 **Longitude:** E59 06 453
Altitude: 200 m
Location: Shariqiyah, Wahiba Sand
Habitat/Site: Communal grazing land
Dominant species:
Grazing pressure: High
Seed collected: Y
Species frequency: Abundant
Species remarks: Fruits yellow
Soil texture: sand
Depth: Deep >2m
Parent rock: Aluvium
Slope: Rolling (10-15%)
Landform: Sand dune

Plate 242 North-Oman - Commicarpus helenae

Genus: *Commicarpus*
Species: *helenae*
Family: Nyctaginaceae
Sub-species:
Local name:
Collector (s): Morag Ferguson, Masoud Harith Al-Adawey, R. Sharma and Saed Al-Alawi
Collection date: 3/29/1998
Country: Oman
Region: Al-Batina
Latitude: N23 35 267 **Longitude:** E58 13 39
Altitude: 45 m
Location: In front of Al Mawelah Fruits and Vegetables Central Market on Musat Royal Road
Habitat/Site: Protected or enclosed
Dominant species: *Acacia tortilis* and *Zizyphus* trees
Grazing pressure: None
Seed collected: N
Species frequency: Occasional
Species remarks: Appears to be browsed
Soil texture: Sandy loam
Depth: Medium 0.5-2 m
Parent rock: Calcareous
Slope: Undulating (2-10%)
Landform: Alluvial pan

Plate 205 North-Oman - Convolvulus variegatus

Genus: *Convolvulus*
Species: *variegatus*
Family: Convulvulaceae
Sub-species:
Local name: frakha
Collector (s): Morag Ferguson, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 3/25/1998
Country: Oman
Region: Al-Batina
Latitude: N24 00 552 **Longitude:** E56 41 772
Altitude: 250 m
Location: From Saham take road to Flaij, then right to Mahab, continue for 11 km, continue through village wadi on left
Habitat/Site: Communal grazing land
Dominant species: *Acacia tortilis*, annual grasses
Grazing pressure: Medium
Seed collected: N
Species frequency:
Species remarks: very good for animals
Soil texture: Loam
Depth: Shallow <0.5 m
Parent rock: Igneous
Slope: Steeply dissected >30%
Landform: Wadi sides

Plate 213 North-Oman - Crotalaria aegyptiaca

Plate 244 North-Oman - Cyperus conglomeratus

Genus: *Crotalaria*
Species: *aegyptiaca*
Family: Leguminosae
Sub-species:
Local name:
Collector (s): Morag Ferguson, Masoud Harith Al-Adawey, R. Sharma and Saed Al-Alawi
Collection date: 28-31 March, 1998
Country: Oman
Region: Al-Batina
Sites: N22 25 009, E57 30 075; N23 05 13, E57 49 32; N23 23 637, E58 04 189; N23 35 267, E58 13 39; N21 57 57; E59 28 434
Altitude: 250 m; 669 m; 400 m; 45 m; 100 m
Location: 60 km before Nizwa on the road from Salalah to Nizwa on right side; 20km from Izki; 10 km after Sawail; in front of Al Mawelah Fruits and Vegetables Central Market; Shariqiyah, Al-Ramilah.
Habitat/Site: Communal grazing land
Dominant species: *Acacia* spp. and *Zizyphus* trees
Grazing pressure: Medium to heavy
Seed collected: Y
Species frequency: Abundant
Species remarks: along the side of the wasis only
Soil texture: Sandy loam; Loam to gravel
Depth: Medium 0.5-2 m to shallow < 0.5 m
Parent rock: Calcareous and igneous
Slope: Undulating (2-10%)
Landform: Wadi sides to alluvial pan

Genus: *Cyperus*
Species: *conglomeratus*
Family: Cyperaceae
Sub-species:
Local name:
Collector (s): Morag Ferguson, Safa'a Al-Farisi, Khalifa, Suleiman Canender, R. Sharma and Saed Al-Alawi
Collection date: 3/31/1998
Country: Oman
Region: Al-Batina
Sites: N22 10 331, E59 06 453; N22 11 358, E59 07 751; N21 45 95, E59 21 323
Altitude: 200 m; 200 m; 100 m
Location: Shariqiyah, Wahiba Sand; Wadi Hassina
Habitat/Site: Communal grazing land
Dominant species: *Presopis* and *Zygophyllum*
Grazing pressure: High to medium
Seed collected: Y
Species frequency: Abundant
Soil texture: Sand to gravel
Depth: Deep >2m
Parent rock: Aluvium
Slope: Rolling (10-15%) to level < 2%
Landform: Sand dune and inland salt pan

Plate 198 North-Oman - Dichanthium foveolatum

Genus: *Dichanthium*
Species: *foveolatum*
Family: Poaceae
Sub-species:
Local name:
Collector (s): Morag Ferguson, Saif Al -kutaiti, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 24 March - 1 April 1998
Country: Oman
Region: Al-Batina
Sites: N24 42 176, E56 29 166; N22 17 752, E59 09 231; N22 47 750, E57 33 085; N23 05 13, E57 49 32; N23 35 267, E58 13 39
Altitude: 5 m; 150 m; 450 m; 669 m; 45 m
Location: Just behind beach slightly raised also nearby hill; Wadi Al Ayn; Nizwa; 20km from Izki army barracks; Al Mawelah Fruits and Vegetables Central Market
Habitat/Site: Communal grazing land except at Al Mawelah (protected Area)
Dominant species: *Panicum turgidum* and *Lasiurus scindicus*; *Acacia tortilis* and *Zizyphus* trees
Grazing pressure: Low to medium
Seed collected: Y
Species frequency: Occasional to frequent
Soil texture: Clay loam to sandy loam
Depth: Deep >2m to < 0.5 m
Parent rock: Calcareous and igneous
Slope: Level <2% to undulating (2-10%)
Landform: Behind beach to alluvial pan

Plate 186 North-Oman - Dipterygium glaucum

Genus: *Dipterygium*
Species: *glaucum*
Family: Capparceae
Collector (s): Morag Ferguson, Saif Al -kutaiti, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 23 March - 1 April 1998
Country: Oman
Region: Al-Batina
Sites: N24 18 749, E56 42 799; N22 25 009, E57 30 075; N21 57 57, E59 28 434; N22 17 752, E59 09 231; N22 47 750, E57 33 085
Altitude: 20 m; 250 m; 100 m; 150 m; 450 m
Location: 4 km from Wadi Hibi rounabout in Sofar; 60 km before Nizwa; Shariqiyah, Al-Ramilah; On Al Kamil Muscat Road; km on right side from roundabout at Nizwa for Salalah road
Habitat/Site: Disturbed roadside and communal grazing land
Dominant species: annual grasses; *Panicum turgidum* and *Lasiurus scindicus*
Grazing pressure: Low to medium
Seed collected: Y
Species frequency: Frequent
Species remarks: Still flowering
Soil texture: Gravel to sandy loam
Depth: Shallow <0.5 m to medium (0.5 m - 2 m)
Parent rock: Aluvium or calcareous
Slope: Level <2% to undulating (2-10%)
Landform: Alluvial pan and Wadi sides

Plate 204 North-Oman - Farsetia linearis

Plate 201 North-Oman - Jaubertia aucheri

Genus: *Farsetia*
Species: *linearis*
Family: Cruciferae
Sub-species:
Local name: sahaa
Collector (s): Morag Ferguson, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 25-29 March 1998
Country: Oman
Region: Al-Batina
Sites: N24 00 552, E56 41 772; N23 23 637, E58 04 189
Altitude: 250 m; 400 m
Location: From Saham take road to Flaij, then right to Mahab, continue for 11 km, continue through village wadi on left; 10 km after Sawail
Habitat/Site: Communal grazing land
Dominant species: *Acacia tortilis*, annual grasses and *Zizyphus* trees
Grazing pressure: Medium to high
Seed collected: N
Species frequency: Frequent
Species remarks: Heavily grazed
Soil texture: Loam to gravel
Depth: Shallow <0.5 m
Parent rock: Igneous
Slope: Steeply dissected >30% to undulating (2-10%)
Landform: Wadi sides

Genus: *Jaubertia*
Species: *aucheri*
Family: Rubiaceae
Sub-species:
Local name: mokrman
Collector (s): Morag Ferguson, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 25-28 March 1998
Country: Oman
Region: Al-Batina
Sites: N24 00 55, 56 41 772; N22 25 009, E57 30 075
Altitude: 250 m
Location: From Saham take road to Flaij, then right to Mahab, continue for 11 km, continue through village wadi on left; 60 km before Nizwa on the road from Salalah
Habitat/Site: Communal grazing land
Dominant species: *Acacia tortilis*, annual grasses
Grazing pressure: Medium
Seed collected: Y
Species frequency: Frequent
Soil texture: Loam to sandy loam
Depth: Shallow <0.5 m to medium 0.5-2 m
Parent rock: Igneous and calcareous
Slope: Steeply dissected >30% to undulating (2-10%)
Landform: Wadi sides; alluvial pan

Plate 212 North-Oman - Lasiurus scindicus

Genus: *Lasiurus*
Species: *scindicus*
Family: Poaceae
Sub-species:
Local name:
Collector (s): Morag Ferguson, Masoud Harith Al-Adawey, R. Sharma and Saed Al-Alawi
Collection date: 28-29 March 1998
Country: Oman
Region: Al-Batina
Sites: N22 25 009, E57 30 075; N23 05 13, E57 49 32; N22 47 750, E57 33 085; N23 23 637, E58 04 189
Altitude: 250 m; 669 m; 420 m; 400 m
Location: 60 km before Nizwa on the road from Salalah to Nizwa on right side; On Izki-Muscat Road; Nizwa - Salalah road; 10 km after Sawail
Habitat/Site: Communal grazing land
Dominant species: *Acacia* spp. - *Zizyphus* spp.
Grazing pressure: None to high
Seed collected: Y
Species frequency: Abundant
Species remarks: some plants appear to be heavily grazed, others not
Soil texture: Loam to sandy loam to gravel
Depth: Medium 0.5-2 m to shallow <0.5 m
Parent rock: Calcareous and igneous
Slope: Undulating (2-10%)
Landform: Wadi sides, alluvial pan

Plate 212 North-Oman - Lasiurus scindicus

Genus: *Lasiurus*
Species: *scindicus*
Family: Poaceae
Sub-species:
Local name:
Collector (s): Morag Ferguson, Masoud Harith Al-Adawey, R. Sharma and Saed Al-Alawi
Collection date: 29 March - 1 April 1998
Country: Oman
Region: Al-Batina
Sites: N23 35 267, E58 13 39; N21 45 95, E59 21 323; N21 57 57, E59 28 434; N22 17 752, E59 09 231
Altitude: 45 m; 100 m; 100 m; 150 m
Location: In front of Al Mawelah Fruits and Vegetables Central Market; Shariqiyah, Wahiba Sand; Al-Ashkarah on Kamil Rd.; Al Kamil - Muscat Road
Habitat/Site: Protected or enclosed; communal grazing land
Dominant species: *Acacia tortilis* and *Zizyphus* trees; *Panicum turgidum* and *Lasiurus scindicus*
Grazing pressure: None to high
Seed collected: Y
Species frequency: Frequent
Species remarks: Mostly shattered
Soil texture: Sandy loam to gravel
Depth: Deep >2m to shallow <0.5 m
Parent rock: Calcareous to aluvium
Slope: Undulating (2-10%) to level <2%
Landform: Alluvial pan to gravel plain

Plate 207 North-Oman - Leucas inflata

Genus: *Leucas*
Species: *inflata*
Family: Labiatae
Sub-species:
Local name: jaadah
Collector (s): Morag Ferguson, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 3/25/1998
Country: Oman
Region: Al-Batina
Latitude: N24 00 552 **Longitude:** E56 41 772
Altitude: 250 m
Location: From Saham take road to Flaij, then right to Mahab, continue for 11 km, continue through village wadi on left
Habitat/Site: Communal grazing land
Dominant species: *Acacia tortilis*, annual grasses
Grazing pressure: Medium
Seed collected: N
Species frequency:
Species remarks: planted by using branches
Soil texture: Loam
Depth: Shallow <0.5 m
Parent rock: Igneous
Slope: Steeply dissected >30%
Landform: Wadi sides

Plate 203 North-Oman - Lycium shawii

Genus: *Lycium*
Species: *shawii*
Family: Solanaceae
Sub-species:
Local name: khasad
Collector (s): Morag Ferguson, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 3/25/1998
Country: Oman
Region: Al-Batina
Latitude: N24 00 552 **Longitude:** E56 41 772
Altitude: 250 m
Location: From Saham take road to Flaij, then right to Mahab, continue for 11 km, continue through village wadi on left
Habitat/Site: Communal grazing land
Dominant species: *Acacia tortilis*, annual grasses
Grazing pressure: Medium
Seed collected: N
Species frequency:
Species remarks:
Soil texture: Loam
Depth: Shallow <0.5 m
Parent rock: Igneous
Slope: Steeply dissected >30%
Landform: Wadi sides

Plate 226 North-Oman - Ochradenus arabicus

Genus: *Ochradenus*
Species: *arabicus*
Family: Resedaceae
Sub-species:
Local name:
Collector (s): Morag Ferguson, Masoud Harith Al-Adawey, R. Sharma and Saed Al-Alawi
Collection date: 3/29/1998
Country: Oman
Region: Al-Batina
Latitude: N23 05 13 **Longitude:** E57 49 32
Altitude: 669 m
Location: On Izki-Muscat Road, 20km from Izki army barracks on right side towards Muscat
Habitat/Site: Communal grazing land
Dominant species: *Acacia - Zizyphus* spp.
Grazing pressure: Medium
Seed collected: N
Species frequency:
Species remarks: Browsed by goats, some plants seeds nearly mature. Other plants flowering
Soil texture: Loam
Depth: Medium 0.5-2 m
Parent rock: Igneous
Slope: Undulating (2-10%)
Landform: Alluvial pan

Plate 202 North-Oman - Ochradenus aucheri

Genus: *Ochradenus*
Species: *aucheri*
Family: Resedaceae
Sub-species:
Local name: jash
Collector (s): Morag Ferguson, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 25-29 March 1998
Country: Oman
Region: Al-Batina
Sites: N24 00 552, E56 41 772; N22 47 750, E57 33 085; N23 05 13, E57 49 32; N23 23 637, E58 04 189
Altitude: 250 m; 420 m; 669 m; 400 m
Location: From Saham take road to Flaij, then right to Mahab, continue for 11 km, continue through village wadi on left; Nizwa for Salalah road; on Izki-Muscat Road; Sawail-Muscat Road
Habitat/Site: Communal grazing land
Dominant species: *Acacia tortilis - Zizyphus* spp., annual grasses
Grazing pressure: Medium
Seed collected: Y
Species frequency: Frequent
Soil texture: Loam to sandy loam to gravel
Depth: Shallow <0.5 m to medium 0.5-2 m
Parent rock: Igneous or calcareous
Slope: Steeply dissected >30% to undulating (2-10%)
Landform: Wadi sides, alluvial pan

Plate 208 North-Oman - Panicum turgidum

Genus: *Panicum*
Species: *turgidum*
Family: Poaceae
Sub-species:
Local name: sakhbar
Collector (s): Morag Ferguson, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 25 March - 1 April 1998
Country: Oman
Region: Al-Batina
Sites: N24 00 552, E56 41 772; N21 57 57, E59 28 434; N22 17 752, E59 09 231
Altitude: 250 m; 100 m; 150 m
Location: From Saham take road to Flaij, then right to Mahab, continue for 11 km, continue through village wadi on left; Shariqiyah, Al-Ramilah; On Al Kamil Muscat Road
Habitat/Site: Communal grazing land
Dominant species: *Acacia tortilis*, annual grasses; *Panicum turgidum* and *Lasiurus scindicus*
Grazing pressure: Medium to low
Seed collected: Y
Species frequency: Frequent
Species remarks: Seeds shattered
Soil texture: Loam; gravel; sandy loam
Depth: Shallow <0.5 m to medium 0.5-2 m
Parent rock: Igneous and calcareous
Slope: Steeply dissected >30% to level <2%
Landform: Wadi sides; gravel plain; alluvial pan

Plate 184 North-Oman - Pennisetum divisum

Genus: *Pennisetum*
Species: *divisum*
Family: Poaceae
Sub-species:
Local name: guthor
Collector (s): Morag Ferguson, Saif Al -kutaiti, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 23 March - 1 April 1998
Country: Oman
Region: Al-Batina
Sites: N24 18 749, E56 42 799; N22 25 009, E57 30 075; N22 47 750, E57 33 085; N23 23 637, E58 04 189; N23 35 267, E58 13 39; N22 17 752, E59 09 231
Altitude: 20 m; 250 m; 420 m; 400 m; 45 m; 150 m
Location: 4 km from Wadi Hibi rounabout in Sofar; 60 km before Nizwa on the road from Salalah; Nizwa - Salalah road; Sawail-Muscat Road; Al Mawelah; Al Kamil Muscat Road
Habitat/Site: Disturbed roadside; communal grazing land; Protected area
Dominant species: annual grasses and *Aerva javanica*, *Zizyphus* trees, *Panicum turgidum* and *Lasiurus scindicus*
Grazing pressure: None to high
Seed collected: Y
Species frequency: Rare to frequent
Soil texture: Gravel to sandy loam
Depth: Shallow <0.5 m to medium 0.5-2 m
Parent rock: Aluvium; calcareous; igneous
Slope: Level <2% to undulating (2-10%)
Landform: Alluvial pan and Wadi sides

Plate 189 North-Oman - Polygala erioptera

Genus: *Polygala*
Species: *erioptera*
Family: Polygalaceae
Sub-species:
Local name:
Collector (s): Morag Ferguson, Saif Al -kutaiti, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 3/24/1998
Country: Oman
Region: Al-Batina
Latitude: N24 27 534 **Longitude:** E56 37 661
Altitude: 10 m
Location: 2 km from Majees roundabout towards jetty on right in Majees Forest Farm 2
Habitat/Site: Protected or enclosed (protected for 8 years. Irrigated forest
Dominant species:
Grazing pressure: None
Seed collected: Y
Species frequency: Rare
Species remarks:
Soil texture: Sandy loam
Depth: Deep >2m
Parent rock: Calcareous
Slope: Level <2%
Landform: Coastal sandy loam

Plate 241 North-Oman - Polygala mascatense

Genus: *Polygala*
Species: *mascatense*
Family: Polygalaceae
Sub-species:
Local name:
Collector (s): Morag Ferguson, Masoud Harith Al-Adawey, R. Sharma and Saed Al-Alawi
Collection date: 3/29/1998
Country: Oman
Region: Al-Batina
Latitude: N23 35 267 **Longitude:** E58 13 39
Altitude: 45 m
Location: In front of Al Mawelah Fruits and Vegetables Central Market on Musat Royal Road
Habitat/Site: Protected or enclosed
Dominant species: *Acacia tortilis* and *Zizyphus* trees
Grazing pressure: None
Seed collected: Y
Species frequency: Occasional
Species remarks: No seeds but seems to be browsed
Soil texture: Sandy loam
Depth: Medium 0.5-2 m
Parent rock: Calcareous
Slope: Undulating (2-10%)
Landform: Alluvial pan

Plate 191 North-Oman - Sporobolus ioclades

Genus: *Sporobolus*
Species: *ioclades*
Family: Poaceae
Sub-species: inamoena
Local name:
Collector (s): Morag Ferguson, Saif Al -kutaiti, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 3/24/1998
Country: Oman
Region: Al-Batina
Latitude: N24 27 534 **Longitude:** E56 37 661
Altitude: 10 m
Location: 2 km from Majees roundabout towards jetty on right in Majees Forest Farm 2
Habitat/Site: Protected or enclosed (protected for 8 years. Irrigated forest
Dominant species:
Grazing pressure: None
Seed collected: Y
Species frequency: Occasional
Species remarks:
Soil texture: Sandy loam
Depth: Deep >2m
Parent rock: Calcareous
Slope: Level <2%
Landform: Coastal sandy loam

Plate 180 North-Oman - Stipagrostis plumosa

Genus: *Stipagrostis*
Species: *plumosa*
Family: Poaceae
Sub-species:
Local name: gammer
Collector (s): Morag Ferguson, Saif Al -kutaiti, Safa'a Al FarisiAli, R. Sharma and Saed Al-Alawi
Collection date: 3/23/1998
Country: Oman
Region: Al-Batina
Latitude: N24 18 749 **Longitude:** E56 42 799
Altitude: 20 m
Location: 4 km from Wadi Hibi rounabout in Sofar
Habitat/Site: Disturbed roadside
Dominant species: annual grasses and *Aerva javanica*
Grazing pressure: Low
Seed collected: Y
Species frequency: Occasional
Species remarks:
Soil texture: Gravel
Depth: Shallow <0.5 m
Parent rock: Aluvium
Slope: Level <2%
Landform: Alluvial pan

Plate 230 North-Oman - Zizyphus spina-christi

Genus: *Zizyphus*
Species: *spina-christi*
Family: Rhamnaceae
Sub-species:
Local name: Omani sedar
Collector (s): Morag Ferguson, Masoud Harith Al-Adawey, R. Sharma and Saed Al-Alawi
Collection date: 3/29/1998
Country: Oman
Region: Al-Batina
Latitude: N23 05 13 **Longitude:** E57 49 32
Altitude: 669 m
Location: On Izki-Muscat Road, 20km from Izki army barracks on right side towards Muscat
Habitat/Site: Communal grazing land
Dominant species: *Acacia - Zizyphus* spp.
Grazing pressure:
Seed collected: N
Species frequency: Frequent
Species remarks:
Soil texture: Loam
Depth: Medium 0.5-2 m
Parent rock: Igneous
Slope: Undulating (2-10%)
Landform: Alluvial pan

Collection in Dhofar Sultanate of Oman 2001

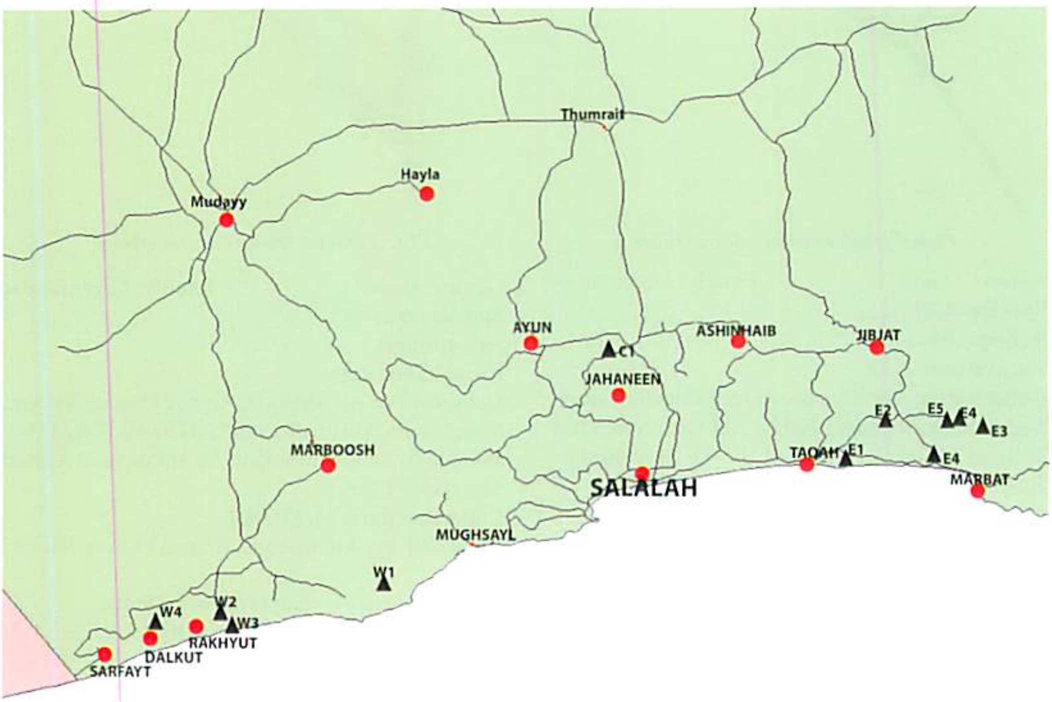

Plate 1 Dhofar/Oman - Acacia nilotica

Genus: *Acacia* **Family:** Leguminosae
Species: *nilotica*
Sub-species: indica ?
Local name: qarat
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 06 59 **Longitude:** E54 39 15
Altitude: 1014 m **Rainfall:** 80 mm
Location: Samhan 2 (lower elevation on Jebal Samhan)
Habitat/Site: Rangeland
Dominant species:
Grazing pressure: High
Seed collected: Y
Species frequency: Frequent
Species remarks: *Cissus quadrangularis* (parasitic plant) was noted smothering the *Acacia* shrubs
Soil texture: Clay **Depth:** 10-15 cm
Parent rock: Limestone
Slope: Undulating

Plate 2 Dhofar/Oman - Acacia etbaica

Genus: *Acacia* **Family:** Leguminosae
Species: *etbaica*
Sub-species:
Local name: saab
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 49 195 **Longitude:** E53 37 453
Altitude: 1065 m **Rainfall:** <100 mm
Location: Shahab Isaeib (Geishan Mountains)
Habitat/Site: Rangeland
Dominant species: *Dracaena serrulata* (airoub), *Dichanthium micranthum* (zadrut), *Loudetia falvida* (ahier) and *Dactyoctenium scindicum* (kazareit)
Grazing pressure: High
Seed collected: Y
Species frequency: Scattered
Species remarks:
Soil texture: Stones/Rocky **Depth:** <30 cm
Parent rock: Limestone
Slope: Steep (>30%)

Plate 3 Dhofar/Oman - Acacia gerardi

Genus: *Acacia* **Family:** Leguminosae
Species: *gerardi*
Sub-species:
Local name: talh
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 06 49 **Longitude:** E54 38 12
Altitude: 937 m **Rainfall:** 100 mm
Location: Karhanut, 56 km from Samhan
Habitat/Site: Rangeland
Dominant species: *Acacia gerardi*, *A. nilotica*
Grazing pressure: High
Seed collected: Y
Species frequency: Scattered
Species remarks: *Cissus quadrangularis* (parasitic plant) was noted smothering the *Acacia* shrubs
Soil texture: Clay **Depth:** 20 cm
Parent rock: Limestone
Slope: Undulating

Plate 4 Dhofar/Oman - Acacia laeta

Genus: *Acacia* **Family:** Leguminosae
Species: *laeta*
Sub-species:
Local name: thour
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/14/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 45 03 **Longitude:** E53 13 06
Altitude: 645 m **Rainfall:** >150 mm
Location: Wadi Saiq (close to Yemen boarders on a narrow road before Dalkut town)
Habitat/Site: Woodland or marginal forest
Dominant species: *Acacia* spp.
Grazing pressure: High
Seed collected: Y
Species frequency: Scattered
Species remarks:
Soil texture: Stones/Rocky **Depth:** >50 cm
Parent rock: Limestone
Slope: Mountenous

Plate 5 Dhofar/Oman - Acacia senegal

Genus: *Acacia* **Family:** Leguminosae
Species: *senegal*
Sub-species:
Local name: thour
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 06 49 **Longitude:** E54 31 21
Altitude: 647 m **Rainfall:** >220-250 mm
Location: Tawi Ateir (few km from Wadi Dirban)
Habitat/Site: Protected or enclosed
Dominant species: *Themeda quadrivalis*, *Apluda mutica* (both highly palatable annual grasses), *Dichanthium aristatum* (zadrut), *Acacia senegal*
Grazing pressure: None
Seed collected: N
Species frequency: Scattered
Species remarks: Good recovery of annual and perrenial species due to protection from grazing
Soil texture: Clay **Depth:** >30 cm
Parent rock: Limestone
Slope: Level (0-3%)

Plate 6-1 Dhofar/Oman - Anogeissus dhofarica

Genus: *Anogeissus* **Family:** Combretaceae
Species: *dhofarica*
Sub-species:
Local name: mushat
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 05 915 **Longitude:** E54 27 07
Altitude: 220 m **Rainfall:** 200 mm
Location: Wadi Dirban (river bank). We drove 29 km east from Salalah, then turned north for about 11 km
Habitat/Site: Woodland or marginal forest
Dominant species: *Anogeissus dhofarica*, *Ziziphus spina-christi*
Grazing pressure: High
Seed collected: Y
Species frequency: Clumped
Species remarks: Permanent spring and crowded with camels and cattle. The pasture has been grazed to the ground. Trees showing grazing line
Soil texture: Sandy loam **Depth:** 100 cm
Parent rock: Limestone
Slope: Level (0-3%)

Plate 6-2 Dhofar/Oman - Anogeissus dhofarica

Genus: *Anogeissus* **Family:** Combretaceae
Species: *dhofarica*
Sub-species:
Local name: mushat
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 46 12 **Longitude:** E53 20 07
Altitude: 850 m **Rainfall:** 300 mm
Location: Anatokh 18 km northwest of Rakhut town
Habitat/Site: Woodland or marginal forest
Dominant species: *Anogeissus dhofarica*, *Ormocarpum dhofarense* (palatable to all livestock), *Blepharis dhofarense*, *Blepharispermum hirtum*, *Acacia senegal*
Grazing pressure: Low
Seed collected: Y
Species frequency: Well represented
Species remarks: Low animal population, probably due to the rough terrain
Soil texture: Clayloam **Depth:** 50-100 cm
Parent rock: Limestone
Slope: Mountainous

Plate 7 Dhofar/Oman - Apluda mutica

Genus: *Apluda* **Family:** Poaceae
Species: *mutica*
Sub-species:
Local name: shabdaf
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 06 49 **Longitude:** E54 31 21
Altitude: 649 m **Rainfall:** 220-250 mm
Location: Tawi Ateir (few km from Wadi Dirban)
Habitat/Site: Protected or enclosed
Dominant species: *Themeda quadrivalis*, *Apluda mutica* (both highly palatable annual grasses), *Dichanthium aristatum* (zadrut), *Acacia senegal*
Grazing pressure: None
Seed collected: Y
Species frequency: Dense
Species remarks: Good recovery of annual and perrenial species due to protection from grazing
Soil texture: Clay **Depth:** >30 cm
Parent rock: Limestone
Slope: Level (0-3%)

Plate 8 Dhofar/Oman - Blepharis dhofarense

Genus: *Blepharis* **Family:** Compositae
Species: *dhofarense*
Sub-species:
Local name: aayloub
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 46 12 **Longitude:** E53 20 07
Altitude: 850 m **Rainfall:** 300 mm
Location: Anatokh 18 km northwest of Rakhut town
Habitat/Site: Woodland or marginal forest
Dominant species: *Anogeissus dhofarica, Ormocarpum dhofarense* (palatable to all livestock), *Blepharis dhofarense, Blepharispermum hirtum, Acacia senegal*
Grazing pressure: Low
Seed collected: N
Species frequency: Well represented
Species remarks: Low animal population, probably due to the rough terrain
Soil texture: Clayloam **Depth:** 50-100 cm
Parent rock: Limestone
Slope: Mountainous

Plate 9 Dhofar/Oman - Blepharispermum hirtum

Genus: *Blepharispermum* **Family:** Compositae
Species: *hirtum*
Sub-species:
Local name: khafut
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 46 12 **Longitude:** E53 20 07
Altitude: 850 m **Rainfall:** 300 mm
Location: Anatokh 18 km northwest of Rakhut town
Habitat/Site: Woodland or marginal forest
Dominant species: *Anogeissus dhofarica, Ormocarpum dhofarense* (palatable to all livestock), *Blepharis dhofarense, Blepharispermum hirtum, Acacia senegal*
Grazing pressure: Low
Seed collected: N
Species frequency: Well represented
Species remarks: Low animal population, probably due to the rough terrain
Soil texture: Clayloam **Depth:** 50-100 cm
Parent rock: Limestone
Slope: Mountainous

Plate 10 Dhofar/Oman - Cenchrus biflorus

Genus: *Cenchrus* **Family:** Poaceae
Species: *biflorus*
Sub-species:
Local name: Athath
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 49 195 **Longitude:** E53 37 453
Altitude: 1065 m **Rainfall:** <100 mm
Location: Shahab Isaeib (Geishan Mountains)
Habitat/Site: Rangeland
Dominant species: *Dracaena serrulata* (airoub), *Dichanthium micranthum* (zadrut), *Loudetia falvida* (ahier) and *Dactyoctenium scindicum* (kazareit)
Grazing pressure: High
Seed collected: Y
Species frequency: Clumped
Species remarks: Perennial grasses are surviving on water harvesting along roadside
Soil texture: Stones/Rocky **Depth:** <30 cm
Parent rock: Limestone
Slope: Steep (>30%)

Plate 11 Dhofar/Oman - Cyperus rotundus

Genus: *Cyperus* **Family:** Cyperaceae
Species: *rotundus*
Sub-species:
Local name: sadoot
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 05 915 **Longitude:** E54 27 07
Altitude: 220 m **Rainfall:** 200 mm
Location: Wadi Dirban (river bank). We drove 29 km east from Salalah, then turned north for about 11 km
Habitat/Site: Woodland or marginal forest
Dominant species: *Anogeissus dhofarica*, *Ziziphus spina-christi*
Grazing pressure: High
Seed collected: N
Species frequency: Scattered
Species remarks: Permanent spring and crowded with camels and cattles. The pasture has been grazed to the ground. Trees showing grazing line
Soil texture: Sandy loam **Depth:** 100 cm
Parent rock: Limestone
Slope: Level (0-3%)

Plate 12-1 Dhofar/Oman - Dactyloctenium scindicum

Genus: *Dactyloctenium* **Family:** Poaceae
Species: *scindicum*
Sub-species:
Local name: kazareet
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Salem Bin Mosalam Geid and Ahmed Suhail Al Marhoun
Collection date: 11/12/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 14 25 **Longitude:** E54 01 43
Altitude: 921 m **Rainfall:** 200 mm
Location: Hajif, 18 km north of Salalah
Habitat/Site: Protected or enclosed
Dominant species: *Dyschoriste dalyi* (dafeid)
Grazing pressure: None
Seed collected: Y
Species frequency: Frequent
Species remarks: Perennial grasses are producing seeds (rainfall 200 mm) due to protection from grazing
Soil texture: Clay **Depth:** >30 cm
Parent rock: Limestone
Slope: Sloping (16-30)

Plate 12-2 Dhofar/Oman - Dactyloctenium scindicum

Genus: *Dactyloctenium* **Family:** Poaceae
Species: *scindicum*
Sub-species:
Local name: kazareet
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 49 195 **Longitude:** E53 37 453
Altitude: 1065 m **Rainfall:** <100 mm
Location: Shahab Isaeib (Geishan Mountains)
Habitat/Site: Rangeland
Dominant species: *Dracaena serrulata* (airoub), *Dichanthium micranthum* (zadrut), *Loudetia falvida* (ahier) and *Dactyoctenium scindicum* (kazareit)
Grazing pressure: High
Seed collected: N
Species frequency: Clumped
Species remarks: Perennial grasses are surviving on water harvesting along roadside
Soil texture: Stones/Rocky **Depth:** <30 cm
Parent rock: Limestone
Slope: Steep (>30%)

Plate 14 Dhofar/Oman - Dactyloctenium sp.

Genus: *Dactyloctenium* **Family:** Poaceae
Species:
Sub-species:
Local name: kazareet
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Salem Bin Mosalam Geid and Ahmed Suhail Al Marhoun
Collection date: 11/12/2001
Identified by: Ahmed Osman
Country: Oman **Governorate:** Dhofar
Latitude: N17 14 25 **Longitude:** E54 01 43
Altitude: 921 m **Rainfall:** 200 mm
Location: Hajif, 18 km north of Salalah
Habitat/Site: Protected or enclosed
Dominant species: *Dyschoriste dalyi* (dafeid)
Grazing pressure: None
Seed collected: Y
Species frequency: Frequent
Species remarks: Perennial grasses are producing seeds (rainfall 200 mm) due to protection from grazing
Soil texture: Clay **Depth:** >30 cm
Parent rock: Limestone
Slope: Sloping (16-30)

Plate 13 Dhofar/Oman - Delonix elata

Genus: *Delonix* **Family:** Leguminosae
Species: *elata*
Sub-species:
Local name: areir
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 03 12 **Longitude:** E54 36 33
Altitude: 325 m **Rainfall:** 250 mm
Location: Wadi Hashir
Habitat/Site: Forest
Dominant species: *Acacia nilotica*
Grazing pressure: High
Seed collected: N
Species frequency: Scattered
Species remarks: Medicinal plant
Soil texture: Clay **Depth:** 10-15 cm
Parent rock: Limestone
Slope: Mountainous

Plate 15 Dhofar/Oman - Dichanthium foveolatum

Genus: *Dichanthium* **Family:** Poaceae
Species: *foveolatum*
Sub-species:
Local name: zadrut
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 06 49 **Longitude:** E54 31 21
Altitude: 647 m **Rainfall:** 220-250 mm
Location: Tawi Ateir (few km from Wadi Dirban)
Habitat/Site: Protected or enclosed
Dominant species: *Themeda quadrivalis*, *Apluda mutica* (both highly palatable annual grasses), *Dichanthium foveolatum* (zadrut), *Acacia senegal*
Grazing pressure: None
Seed collected: N
Species frequency: Scattered
Species remarks: Palatable perennial grass
Soil texture: Clay **Depth:** >30 cm
Parent rock: Limestone
Slope: Level (0-3%)

Plate 16 Dhofar/Oman - Dichanthium micranthum

Genus: *Dichanthium* **Family:** Poaceae
Species: *micranthum*
Sub-species:
Local name: zadrut
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 49 195 **Longitude:** E53 37 453
Altitude: 1065 m **Rainfall:** <100 mm
Location: Shahab Isaeib (Geishan Mountains)
Habitat/Site: Rangeland
Dominant species: *Dracaena serrulata* (airoub), *Dichanthium micranthum* (zadrut), *Loudetia falvida* (ahier) and *Dactyoctenium scindicum* (kazareit)
Grazing pressure: High
Seed collected: N
Species frequency: Clumped
Species remarks: Perennial grasses are surviving on water harvesting along roadside
Soil texture: Stones/Rocky **Depth:** <30 cm
Parent rock: Limestone
Slope: Steep (>30%)

Plate 17 Dhofar/Oman - Dodonaea angustifolia

Genus: *Dodonaea* **Family:** Sapindaceae
Species: *angustifolia*
Sub-species:
Local name: sheraz
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 06 09 **Longitude:** E54 41 53
Altitude: 1255 m **Rainfall:** 80 mm
Location: Jebal Samhan
Habitat/Site: Rangeland
Dominant species: *Euphorbia balsamiphora* (the juice is used locally to produce 'Elka'), *Solanum incanum* (indicator of overgrazing, and *Dodonaea angustifolia* (unpalatable species also found in other areas overgrazed)
Grazing pressure: High
Seed collected: N
Species frequency: Frequent
Species remarks: Several species are non-palatable
Soil texture: Clayloam **Depth:** 10-15 cm
Parent rock: Limestone
Slope: Mountainous

Plate 18 Dhofar/Oman - Dracaena serrulata

Genus: *Dracaena* **Family:** Agavaceae
Species: *serrulata*
Sub-species:
Local name: airoub
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 49 195 **Longitude:** E53 37 453
Altitude: 1065 m **Rainfall:** <100 mm
Location: Shahab Isaeib (Geishan Mountains)
Habitat/Site: Rangeland
Dominant species: *Dracaena serrulata* (airoub), *Dichanthium micranthum* (zadrut), *Loudetia falvida* (ahier) and *Dactyoctenium scindicum* (kazareit)
Grazing pressure: High
Seed collected: N
Species frequency: Scattered
Species remarks: The species was used for making robes in the past
Soil texture: Stones/Rocky **Depth:** <30 cm
Parent rock: Limestone
Slope: Steep (>30%)

Plate 19 Dhofar/Oman - Dyschoriste dalyi

Genus: *Dyschoriste* **Family:** Acanthaceae
Species: *dalyi*
Sub-species:
Local name: dafeid
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Salem Bin Mosalam Geid and Ahmed Suhail Al Marhoun
Collection date: 11/12/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 14 25 **Longitude:** E54 01 43
Altitude: 921 m **Rainfall:** 200 mm
Location: Hajif, 18 km north of Salalah
Habitat/Site: Protected or enclosed
Dominant species: *Dyschoriste dalyi* (dafeid)
Grazing pressure: None
Seed collected: Y
Species frequency: Frequent
Species remarks: Good grazing value, very much affected by grazing pressure outside the fence
Soil texture: Clay **Depth:** >30 cm
Parent rock: Limestone
Slope: Sloping (16-30)

Plate 20 Dhofar/Oman - Euphorbia balsamiphora

Genus: *Euphorbia* **Family:** Euphorbiaceae
Species: *balsamiphora*
Sub-species:
Local name: tashqout
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Salem Bin Mosalam Geid and Ahmed Suhail Al Marhoun
Collection date: 11/12/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 14 25 **Longitude:** E54 01 43
Altitude: 921 m **Rainfall:** 200 mm
Location: Hajif, 18 km north of Salalah
Habitat/Site: Protected or enclosed
Dominant species: *Dyschoriste dalyi* (dafeid)
Grazing pressure: None
Seed collected: Y
Species frequency: Frequent
Species remarks: Medicinal plant also used for producing gum 'elka' by local people
Soil texture: Clay **Depth:** >30 cm
Parent rock: Limestone
Slope: Sloping (16-30)

Plate 21 Dhofar/Oman - Ficus sycomorus

Genus: *Ficus* **Family:** Moraceae
Species: *sycomorus*
Sub-species:
Local name: qadait
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 05 915 **Longitude:** E54 27 07
Altitude: 220 m **Rainfall:** 200 mm
Location: Wadi Dirban (river bank). We drove 29 km east from Salalah, then turned north for about 11 km
Habitat/Site: Woodland or marginal forest
Dominant species: *Anogeissus dhofarica, Ziziphus spina-christi*
Grazing pressure: High
Seed collected: N
Species frequency: Scattered
Species remarks: Permanent spring and crowded with camels and cattle. The pasture has been grazed to the ground. Trees showing grazing line
Soil texture: Sandy loam **Depth:** 100 cm
Parent rock: Limestone
Slope: Level (0-3%)

Plate 22 Dhofar/Oman - Ficus vasta

Genus: *Ficus* **Family:** Moraceae
Species: *vasta*
Sub-species:
Local name: teeq
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 05 915 **Longitude:** E54 27 07
Altitude: 220 m **Rainfall:** 200 mm
Location: Wadi Dirban (river bank). We drove 29 km east from Salalah, then turned north for about 11 km
Habitat/Site: Woodland or marginal forest
Dominant species: *Anogeissus dhofarica, Ziziphus spina-christi*
Grazing pressure: High
Seed collected: N
Species frequency: Scattered
Species remarks: Permanent spring and crowded with camels and cattles. The pasture has been grazed to the ground. Trees showing grazing line
Soil texture: Sandy loam **Depth:** 100 cm
Parent rock: Limestone
Slope: Level (0-3%)

Plate 23 Dhofar/Oman - Grewia bicolor

Genus: *Grewia* **Family:** Tiliaceae
Species: *bicolor*
Sub-species:
Local name: qarad
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/14/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 45 03 **Longitude:** E53 13 06
Altitude: 645 m **Rainfall:** 100-150 mm
Location: Wadi Saiq (close to Yemen boarders on a narrow road before Dalkut town)
Habitat/Site: Woodland or marginal forest
Dominant species: *Acacia* spp.
Grazing pressure: High
Seed collected: N
Species frequency: Scattered
Species remarks: *Acacia* spp. dominant
Soil texture: Stones/Rocky **Depth:** >50 cm
Parent rock: Limestone
Slope: Mountainous

Plate 24 Dhofar/Oman - Loudetia flavida

Genus: *Loudetia* **Family:** Graminae?
Species: *flavida*
Sub-species:
Local name: al-ahier
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 49 195 **Longitude:** E53 37 453
Altitude: 1065 m **Rainfall:** <100 mm
Location: Shahab Isaeib (Geishan Mountains)
Habitat/Site: Rangeland
Dominant species: *Dracaena serrulata* (airoub), *Dichanthium micranthum* (zadrut), *Loudetia falvida* (ahier) and *Dactyoctenium scindicum* (kazareit)
Grazing pressure: High
Seed collected: Y
Species frequency: Scattered
Species remarks:
Soil texture: Stones/Rocky **Depth:** <30 cm
Parent rock: Limestone
Slope: Steep (>30%)

Plate 25 Dhofar/Oman - Maytenus dhofarensis

Genus: *Maytenus* **Family:** Celastraceae
Species: *dhofarensis*
Sub-species:
Local name: shirbait
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Salem Bin Mosalam Geid and Ahmed Suhail Al Marhoun
Collection date: 11/12/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 14 25 **Longitude:** E54 01 43
Altitude: 921 m **Rainfall:** 200 mm
Location: Hajif, 18 km north of Salalah
Habitat/Site: Protected or enclosed
Dominant species: *Dyschoriste dalyi* (dafeid)
Grazing pressure: None
Seed collected: N
Species frequency: Frequent
Species remarks: Trees
Soil texture: Clay **Depth:** >30 cm
Parent rock: Limestone
Slope: Sloping (16-30)

Plate 26 Dhofar/Oman - Ormocarpum dhofarense

Genus: *Ormocarpum* **Family:** Leguminosae
Species: *dhofarense*
Sub-species:
Local name: khair
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/13/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 46 12 **Longitude:** E53 20 07
Altitude: 850 m **Rainfall:** 300 mm
Location: Anatokh 18 km northwest of Rakhut town
Habitat/Site: Rangeland
Dominant species: *Anogeissus dhofarica*
Grazing pressure: Low
Seed collected: Y
Species frequency: Frequent
Species remarks: Very palatable to all livestock
Soil texture: Clayloam **Depth:** 50-100 cm
Parent rock: Limestone
Slope: Mountainous

Plate 27 Dhofar/Oman - Premna resinosa

Genus: *Premna* **Family:** Verbenaceae
Species: *resinosa*
Sub-species:
Local name: shibhait
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Masalam Ali Hardan and Ahmed Mosalam Al Amri
Collection date: 11/14/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N16 45 03 **Longitude:** E53 13 06
Altitude: 645 m **Rainfall:** 100-150 mm
Location: Wadi Saiq (close to Yemen boarders on a narrow road before Dalkut town)
Habitat/Site: Woodland or marginal forest
Dominant species: *Acacia* spp.
Grazing pressure: Low
Seed collected: N
Species frequency: Frequent
Species remarks: *Acacia* spp. dominant
Soil texture: Stones/Rocky **Depth:** >50 cm
Parent rock: Limestone
Slope: Mountainous

Plate 28 Dhofar/Oman - Tamarindus indica

Genus: *Tamarindus* **Family:** Leguminosae
Species: *indica*
Sub-species:
Local name: sabbar (aradeeb)
Collector (s): Ali Shehade, Ahmed Osman, Saleem Nadaf, Salih Al Hinahi, Safa'a Al Farisi, Saeed Bin Masoud Al Omari, Mohamed Bin Ali Al Awid and Ahmed Awad Bakir
Collection date: 11/11/2001
Identified by: Ali Shehade, Ahmed Osman, Saleem Nadaf
Country: Oman **Governorate:** Dhofar
Latitude: N17 03 12 **Longitude:** E54 36 33
Altitude: 325 m **Rainfall:** 250 mm
Location: Wadi Hashir
Habitat/Site: Forest
Dominant species: *Acacia nilotica*
Grazing pressure: High
Seed collected: N
Species frequency: Frequent
Species remarks: *Cissus quadrangularis* (parasitic plant) was noted smothering both small and big plants, also noted presence of *Adonsonia digitata*
Family: Bombacaceae
Soil texture: Clay **Depth:** 10-15 cm
Parent rock: Limestone
Slope: Mountainous

Collection in the Kingdom of Bahrain 2002

Plate 1 Bahrain - Panicum turgidum

Genus: *Panicum*

Species: *turgidum*

Family: Poaceae

Local name: Thumam

Collection date: 2002

Collector (s): Ahmed Ibrahim Awad Al Karim

Identified by: Ahmed Ibrahim Awad Al Karim

Country: Kingdom of Bahrain

Collection site: Ras Al Bar

Latitude: N25 50

Longitude: E50 33

Plate 2 Bahrain - Pennisetum divisum

Genus: *Pennisetum*

Species: *divisum*

Family: Poaceae

Local name: Thaymoum

Collection date: 2002

Collector (s): Ahmed Ibrahim Awad Al Karim

Identified by: Ahmed Ibrahim Awad Al Karim

Country: Kingdom of Bahrain

Collection site: Ras Al Bar

Latitude: N25 50

Longitude: E50 33

Collection in Qatar 1998-2004

Plate 1 Qatar - Acacia ehrenbergiana

Genus: *Acacia* **Family:** Leguminosae
Species: *ehrenbergiana*
Local name: Salam
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Jeryan Al Batna
Latitude: N35 00 87 **Longitude:** E17 37 12
Vegetation district zone: Southern Inland Zone
Ecological site & plant communities: Plant communities of depressions of deep silty clay loam soils: These depressions are usually called "Rawdat" in Qatar
Dominant species: The plant community consists mainly of: *Acacia tortilis*, *Acacia ehrenbergia*, *Ziziphus nummularia* trees and *Lycium shawii* shrubs, other species include *Avena javanica*, *Anastatica hierochuntica*, *Cassia italica*, *Citrullus colocynthis* and many others.
Soil texture: Deep silty clay loam
Depth: 50-150 cm deep

Plate 2 Qatar - Acacia tortilis community

Genus: *Acacia* **Family:** Leguminosae
Species: *tortilis*
Local name: Samar
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Al Ghuwairiya
Latitude: N45 62 48 **Longitude:** E20 47 91
Vegetation district zone: Northern Inland Zone
Ecological site & plant communities: Plant communities of depressions of deep silty clay loam soils: These depressions are usually called "Rawdat" in Qatar
Dominant species: The plant community consists mainly of: *Acacia tortilis*, *Acacia ehrenbergia*, *Ziziphus nummularia* trees and *Lycium shawii* shrubs, other species include *Avena javanica*, *Anastatica hierochuntica*, *Cassia italica*, *Citrullus colocynthis* and many others.
Soil texture: Deep silty clay loam
Depth: 50-150 cm deep

Plate 3 Qatar - Cenchrus biflorus

Genus: *Cenchrus* **Family:** Poaceae
Species: *biflorus*
Local name: Haskaneet
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Doha
Latitude: **Longitude:**
Vegetation district zone: Central Inland Zone
Ecological site & plant communities: Plant communities of depressions of sandy to sandy loam soils
Dominant species: Grasses such as: *Chrysopogon gryllus* and *Cymbopogon commutatus* are common. *Acacia* trees also found such as *Acacia tortilis*, *Acacia ehrenbergia*. Legumes include: *Astragalus* sp., *Astragalus sieberi*, *Blepharis ciliaris*,
Soil texture: Mainly sandy soils but occasionally mixture of sand, silt, loam, small and large-sized rocks. Soil is non saline to slight saline ranging from 0.32-2.37 ds/m.
Depth:

Plate 4 Qatar - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Poaceae
Species: *ciliaris*
Local name: Sabat
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Doha
Latitude: N36 40 66 **Longitude:** E19 72 02
Vegetation district zone: Southern Inland Zone
Ecological site & plant communities: Plant communities of depressions of sandy to sandy loam soils
Dominant species: Grasses such as: *Chrysopogon gryllus* and *Cymbopogon commutatus* are common. *Acacia* trees also found such as *Acacia tortilis*, *Acacia ehrenbergia*. Legumes include: *Astragalus* sp., *Astragalus sieberi*, *Blepharis ciliaris*,
Soil texture: Mainly sandy soils but occasionally mixture of sand, silt, loam, small and large-sized rocks. Soil is non saline to slight saline ranging from 0.32-2.37 ds/m.
Depth:

Plate 5 Doha/Qatar - Chloris virgata

Genus: *Chloris* **Family:** Poaceae
Species: *virgata*
Local name: Khazamzam
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Doha
Latitude: **Longitude:**
Vegetation district zone: Central Inland Zone
Ecological site & plant communities: Plant community of disturbed areas
Dominant species: The main tree species are *Acacia tortilis*, *Acacia ehrenbergia*. Others include: *Aeluropus lagopoides*, *Aizooon canariense*, *Anabasis setifera*, *Astragalus* sp., Capparis spinosa, *Cassia italica*, and grasses such as: *Chloris virgata*, *Cymbopogon commutatus*, *Cyperus conglomerates*, *Cyperus rotundus*, *Dichanthium foveolatum*, *Pennisetum divisum* and those which belong to Chenopodiaceae: *Salsola baryosma*, *Salsola vermiculata* and *Atriplex leucoclada*
Soil texture: This habitat is composed of rocky sandy flat areas and fine- textured soil mixed with rock depressions. Soil is non-saline (3.1 ds/m), with high diverse vegetation due to weeds infestations
Depth:

Plate 6 Doha/Qatar - Chrysopogon aucheri

Genus: *Chrysopogon* **Family:** Gramineae
Species: *aucheri*
Local name: haltaa
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Al Jemailiya
Latitude: N40 28 00 **Longitude:** E20 27 00
Vegetation district zone: Central Inland Zone
Ecological site & plant communities: Plant communities of depressions of deep silty clay loam soils
Dominant species: The plant community consists mainly of: *Acacia tortilis*, *Acacia ehrenbergia*, *Ziziphus nummularia* trees and *Lycium shawii* shrubs, other species include *Avena javanica*, *Anastatica hierochuntica*, *Cassia italica*, *Citrullus colocynthis* and many others.
Soil texture: Deep silty clay loam
Depth: 50-150 cm deep

Plate 7 Qatar - Cymbopogon commutatus

Genus: *Cymbopogon* **Family:** Gramineae
Species: *commutatus*
Local name: Skhabar
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Al Jemailiya
Latitude: N42 90 64 **Longitude:** E20 69 55
Vegetation district zone: Central Inland Zone
Ecological site & plant communities: Plant communities of depressions of deep silty clay loam soils
Dominant species: The plant community consists mainly of: *Acacia tortilis*, *Acacia ehrenbergia*, *Ziziphus nummularia* trees and *Lycium shawii* shrubs, other species include *Avena javanica*, *Anastatica hierochuntica*, *Cassia italica*, *Citrullus colocynthis* and many others.
Soil texture: Deep silty clay loam
Depth: 50-100 cm

Plate 8 Qatar - Eleusine compressa

Genus: *Eleusine* **Family:** Gramineae
Species: *compressa*
Local name: Sanim
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Jeryan Al Batna
Latitude: N33 26 64 **Longitude:** E16 18 85
Vegetation district zone: Southern Inland Zone
Ecological site & plant communities: Plant communities of depressions of sandy to sandy loam soils
Dominant species: Grasses such as: *Chrysopogon gryllus* and *Cymbopogon commutatus* are common. *Acacia* trees also found such as *Acacia tortilis*, *Acacia ehrenbergia*. Legumes include: *Astragalus* sp., *Astragalus sieberi*, *Blepharis ciliaris*,
Soil texture: Mainly sandy soils but occasionally mixture of sand, silt, loam, small and large-sized rocks. Soil is non saline to slight saline ranging from 0.32-2.37 ds/m.
Depth:

Plate 9 Qatar - Lasiurus hirsutus

Genus: *Lasiurus* **Family:** Poaceae
Species: *hirsutus*
Local name: Da'aa
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Jeryan Al Batna
Latitude: N39 96 08 **Longitude:** E17 14 46
Vegetation district zone: Southern Inland Zone
Ecological site & plant communities: Plant communities of depressions of sandy to sandy loam soils
Dominant species: Grasses such as: *Chrysopogon gryllus* and *Cymbopogon commutatus* are common. *Acacia* trees also found such as *Acacia tortilis*, *Acacia ehrenbergia*. Legumes include: *Astragalus* sp., *Astragalus sieberi*, *Blepharis ciliaris*,
Soil texture: Mainly sandy soils but occasionally mixture of sand, silt, loam, small and large-sized rocks. Soil is non saline to slight saline ranging from 0.32-2.37 ds/m.
Depth:

Plate 10 Qatar - Lycium shawii

Genus: *Lycium* **Family:** Solanaceae
Species: *shawii*
Local name: Awsag
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar
Governorate: Madinat Al Shamal
Latitude: N46 91 18 **Longitude:** E21 11 72
Vegetation district zone: Northern Inland Zone
Ecological site & plant communities: Plant communities of depressions of sandy to sandy loam soils
Dominant species: The plant community consists mainly of: *Acacia tortilis*, *Acacia ehrenbergia*, *Ziziphus nummularia* trees and *Lycium shawii* shrubs, other species include *Avena javanica*, *Anastatica hierochuntica*, *Cassia italica*, *Citrullus colocynthis* and many others.
Soil texture: Deep silty clay loam
Depth: 50-150 cm deep

Plate 11 Qatar - Panicum turgidum

Genus: *Panicum* **Family:** Poaceae
Species: *turgidum*
Local name: Thumam
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar
Governorate: Doha
Latitude: N36 40 66 **Longitude:** E19 72 02
Vegetation district zone: Central Inland Zone
Ecological site & plant communities: Plant communities of degressions of sandy to sandy loam soils
Dominant species: Grasses such as: *Chrysopogon gryllus* and *Cymbopogon commutatus* are common. *Acacia* trees also found such as *Acacia tortilis*, *Acacia ehrenbergia*. legumes include: *Astragalus* sp., *Astragalus sieberi*, *Blepharis ciliaris*,
Soil texture: Mainly sandy soils but occasionally mixture of sand, silt, loam, small and large-sized rocks. Soil is non saline to slight saline ranging from 0.32-2.37 ds/m.
Depth:

Plate 12 Qatar - Pennisetum divisum

Genus: *Pennisetum* **Family:** Poaceae
Species: *divisum*
Local name: Thaymoum
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Jeryan Al Batna
Latitude: N34 01 99 **Longitude:** E18 27 54
Vegetation district zone: Southern Inland Zone
Ecological site & plant communities: Plant Communities of depressions of deep silty clay loam soils
Dominant species: Grasses such as: *Chrysopogon gryllus* and *Cymbopogon commutatus* are common. *Acacia* trees also found such as *Acacia tortilis*, *Acacia ehrenbergia*. Legumes include: *Astragalus* sp., *Astragalus sieberi*, *Blepharis ciliaris*,
Soil texture: Mainly sandy soils but occasionally mixture of sand, silt, loam, small and large-sized rocks. Soil is non saline to slight saline ranging from 0.32-2.37 ds/m.
Depth:

Plate 13 Qatar - Sporobolus spicatus

Genus: *Sporobolus* **Family:** Poaceae
Species: *spicatus*
Local name:
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar **Governorate:** Al Khor
Latitude: N43 45 55 **Longitude:** E22 55 74
Vegetation district zone: North East Coastal Zone
Ecological site & plant communities: Plant communities of salt flats
Dominant species: The members of plant found were: *Anabasis setifera*, *Tamarix* sp., *Stipa capensis*, *Sporobolus arabicus*, *Salsola baryosma*, *Zygophyllum qatarense*, *Cyperus conglomerates*, *Heliotropium bacciferum*, *Pulicaria gnaphalodes*, *Arnebia hispidissima*, *Launaea nudicaulis*, *Leucaena leucocephala* and *Prosopis chilensis*.
Soil texture: Soil is affected by sea water and characterized by strong salinity which can reach 61.1 ds/m.
Depth: 10-150 cm deep

Plate 14 Qatar - Ziziphus nummularia

Genus: *Ziziphus* **Family:** Rhamnaceae
Species: *nummularia*
Local name: Sidir
Collection date: 1998-2004
Collector (s): Mohamed Ali Hassan
Identified by: Mohamed Ali Hassan and Ikhlas Abdel Bari
Country: Qatar
Governorate: Madinat Al Shamal
Latitude: N45 62 48 **Longitude:** E20 47 91
Vegetation district zone: Northern Inland Zone
Ecological site & plant communities: Plant communities of depressions of deep silty clay loam soils
Dominant species: The plant community consists mainly of: *Acacia tortilis*, *Acacia ehrenbergia*, *Ziziphus nummularia* trees and *Lycium shawii* shrubs, other species include *Avena javanica*, *Anastatica hierochuntica*, *Cassia italica*, *Citrullus colocynthis* and many others.
Soil texture: Deep silty clay loam
Depth: 50-150 cm deep

Collection in the Kingdom of Saudi Arabia 2002-2003

Plate 2 KSA - Panicum turgidum

Genus: *Panicum*

Species: *turgidum*

Family: Poaceae

Local name: Thumam

Collection date: 2002/03

Collector (s): Ageel Alhamdan, Abdelrahman Alrabiea and Adel Mohsein Al quraine

Identified by: Ageel Alhamdan, Abelrahman Alrabiea and Abdel Mohsein Al quraine

Country: Kingdom of Saudi Arabia

Collection site: Al Zuflee and Sdeer Area

Latitude: N26 30

Longitude: E44 30

Plate 3 KSA - Pennisetum divisum

Genus: *Pennisetum*

Species: *divisum*

Family: Poaceae

Local name: Thaymoum

Collection date: 2002/03

Collector (s): Ageel Alhamdan, Abdelrahman Alrabiea and Adel Mohsein Al quraine

Identified by: Ageel Alhamdan, Abelrahman Alrabiea and Abdel Mohsein Al quraine

Country: Kingdom of Saudi Arabia

Collection site: Al Zuflee and Sdeer Area

Latitude: N26 30

Longitude: E44 30

Collection in Yemen 1998

Plate 1 Yemen - Andropogon distachyos

Plate 2 Yemen - Andropogon Sp.

Genus: *Andropogon* **Family:** Gramineae

Species: *distachyos*

Collector (s): Ali Abdul Malik

Collection date: 6/6/1998

Identified by: Ali Abdul Malik

Country: Yemen

Collection site: Khawlan

No. of accessions: 10

Latitude: N15 15

Longitude: E44 30

Altitude (m): 2250

Genus: *Andropogon* **Family:** Gramineae

Species:

Collector (s): Ali Abdul Malik

Collection date: 6/8/1998

Identified by: Ali Abdul Malik

Country: Yemen

Collection site: Mahweet

No. of accessions: 3

Latitude: N15 25

Longitude: E43 30

Altitude (m): 2000

Plate 3 Yemen - Cenchrus ciliaris

Plate 4 Yemen - Cenchrus ciliaris

Genus: *Cenchrus* **Family:** Gramineae

Species: *ciliaris*

Collector (s): Ali Abdul Malik

Collection date: 6/8/1998

Identified by: Ali Abdul Malik

Country: Yemen

Collection site: Hamdan

No. of accessions: 3

Latitude: N15 30

Longitude: E44 50

Altitude (m): 2350

Genus: *Cenchrus* **Family:** Gramineae

Species: *ciliaris*

Collector (s): Gamhoria Al Khader Ahmed

Collection date: Feb. 1998

Identified by: Gamhoria Al Khader Ahmed

Country: Yemen

Collection site: Habil Al Rida and Tor Al Baha

No. of accessions: 2

Latitude:

Longitude:

Altitude (m): 150-1500

Plate 5 Yemen - Pennisetum thunbergii

Plate 6 Yemen - Panicum turgidum

Genus: *Pennisetum* **Family:** Gramineae

Species: *thunbergii*

Collector (s): Ali Abdul Malik

Collection date: 6/25/1998

Identified by: Ali Abdul Malik

Country: Yemen

Collection site: Ras Al Bar

No. of accessions: 2

Latitude: N15 10

Longitude: E43 40

Altitude (m): 2200

Genus: *Panicum* **Family:** Gramineae

Species: *turgidun*

Collector (s): Gamhoria Al Khader Ahmed

Collection date: Feb 1998

Identified by: Gamhoria Al Khader Ahmed

Country: Yemen

Collection site: Alwahat & Tor Al Baha

No. of accessions: 1

Latitude:

Longitude:

Altitude (m): 150

Annex I

Report on the Collection of Rangeland Plant Germplasm in the Sultanate of Oman
20 March to 6 April 1998

Dr Morag Ferguson

Introduction

A major priority research activity of the "Rangeland, Shrubs, Irrigated Forages & Livestock" Theme of Phase II of the project "Strengthening Agricultural Research and Human Resource Development in the Arabian Peninsula" is R.1.2.2. "Collection, classification and storage of indigenous pasture and ra! Plants including shrubs" (ICARDA scientists Dr J. Valkoun and Dr L. Robertson). In order to address this research activity a germplasm collection was carried out for the major indigenous forage grasses, legumes, shrubs and trees of the Sultanate of Oman, with the ultimate objective of utilizing the most promising germplasm for degraded rangeland rehabilitation and for irrigated fodder production under systems requiring substantially less water than those currently used (alfalfa and Rhodes grass). An integral part of this collection mission was the training of Omani scientists from different regional research stations in practical germplasm collection procedures, to complete the largely theoretical "Germplasm Collection and Maintenance Course" held in Dubai.

Objectives of the mission

1. Train 6 Omani scientists in practical germplasm collection procedures

2. Identify priority species

3. Collect seed of those indigenous forage grasses, legumes, shrubs and trees for which mature seed was available

4. Record the development stage of those species for which mature seed was unavailable

5. Record the threat to genetic erosion of target species

6. Record the geographical distribution of target taxa

Collaborating Institutes

- Directorate General for Agricultural Research, Ministry of Agriculture and Fisheries, P.O. Box 50, Muscat, P. Code 121, Sultanate of Oman (DGAR)

- International Center for Agricultural Research in the Dry Areas - Arabian Peninsula Regional Program, P.O. Box 13979, Dubai, UAE. (ICARDA-APRP)
- Genetic Resources Unit, P.O. Box 5466, Aleppo, Syria (ICARDA-GRU).

Mission Participants

Full Time

Ms. Safa'a M. Al-Farsi, DGAR, Oman
Mr. Saeed Hamad Al-Alawi, DGAR, Oman
Dr. R.K. Sharma, DGAR, Oman
Dr. Morag Ferguson, ICARDA -APRP (MF)

Part Time

Mr. Saif Al-Kutaiti, DGAR, Soha, Oman
Mr. Masoud Harith Al-Adawey, DGAR, Nizwa, Oman
Mr. Khalifa Hamad Al-Jaffari, DGAR, Al-Kamil, Oman

Target area

Northern regions of Oman including the northern and eastern coastal plains, Wahiba Sands, the northern and eastern interior plains and Hajar Mountains.

Initial list of target species

This list of target species was compiled as a result of discussions with farmers in the UAE, local botanists and Dr Henri Le Houerou, international consultant on rangeland development. The list was modified immediately prior to the mission as a result of discussions with Dr Shahina Ghazanfar, botanical consultant, Oman (see Table 3). Additional modifications were made after the mission as a result of personal observations and discussions with farmers, and divided into those species of high and medium priority (see Tables 4 and 5).

* indicates those species of high priority

Perennial grasses

*Cenchrus ciliaris**
*Coelochyrum piercei**
*Dichanthium faveolatum**
*Lasiurus scindicus**
Ochtochloa compressa or Elusine compressa Panicum turgidum *
Pennisetum divisum *
Sporobolus spicatus
Stipagrostis plumosa
Astenatherum forskalii

Trees and Shrubs

Echiochilon kotchyi
Dipterigium glaucum *
*Maerua crassifolia**
Gymnocarpos decandrum
Haloxylon persicum
Helianthemum kahiricum
Helianthemum lippii
*Rhanterium epapposum**
Ephedra foliata
Moringa peregrina
Calligonum comosum *
Tamarix aucherana
Tamarix Arabica
Indigofera articulata
Dyerophtum indicum
Leptadenia pyrotechnica

Summary of accessions collected and sites visited

Total number of seed accessions collected: 68
Total number of taxa from which seed was collected: 28
Percentage of target taxa collected, for which mature seed was available: 72.7% 22 herbarium species
Number of sites visited: 18
Average number of sites per day of collection: 3
Average number of accessions per day of collection: 11.3

Itinerary

A map of the collection sites and the major towns mentioned in the text is given in Figure 1.

20 March Arrived in Muscat at 19.30. Stayed at Seeb Novotel

21 March

Mr. Ali Al-Jabri (Director General, Directorate General of Agricultural Reseach, Rumais) was travelling so we were unable to meet. MF met directly with my three counterparts Ms. Safa Farsi, Mr. Saeed Al-Alawi and Dr. R.K. Sharma. We set off immediately for the National Herbarium located within the Natural History Museum, Muscat in order to familiarise ourselves with our target species and to determine their geographical distribution within Oman. We met with Khair Antar, Director of the National History Museum. Extensive notes were taken regarding geographical ranges, but time was limiting so we could not record all the available information. Staff at the National Herbarium are gradually entering all species passport data (14 000 specimens) into a database, although, with limited resources, this is likely to be a very lengthy process. It was suggested DGAR may be able to assist with entering data for the target species that we are interested in, as this would greatly benefit the ecogeographic survey that is needed in order to undertake effective genetic resource activities.

We met with Dr. Shahina Ghazanfar, an authority on the Flora of Oman. She reviewed our list of target species and suggested some modifications. She suggested that we visit David Install, Directorate General of Nature Reserves who would be able to advise on protected areas for collection and those areas which had been 'set aside' by pastoralists for grazing in 'bad' years. She also advised us ofthe Maconaky Rangeland Survey, 1986 and suggested we contact Steve Davis and Hugh Prendergast at SEP ASAL, Kew.

22 March

Met with Mike Gallagher, former Director of the Natural History Museum. He informed us of an Australian organisation (GRM), which did a rangeland review and undertook rehabilitation work in Salalah. He also suggested that Dr. Ray Lawton, Mulberry House, Stanville Road, Cumnor Hill, Oxford OX29JF (01865864283) may be able to advise on promising tree species. We returned to the National Herbarium and planned our collection route.

23 March

We set off up the East coast, the Batina region, to Sofar. This area is the major agricultural area with date palm, alfalfa, Rhodes grass and vegetables grown. A rapidly declining water table and increasing salinity are however major problems. The tap water in this region has salinity levels of approximately 14 OOOppm. We firstly visited the Ministry nursery at Sofar in order to arrange accommodation at the Guest House. Technicians brought in indigenous plants which they perceived as being potentially good forage species, these included Cenchrus ciliaris and Astragalusfatmensis. We then went to Gathanfan Research Station and met up with Saif Al-Kutaiti, our local counterpart and Abdul Rahim, technician. The research station is situated in a plot of approximately 80ha of gravel plain, dominated by Acacia tortilis. It has new administrative facilities and was planned as a research and extension centre for vegetables, protected agriculture, alfalfa and Rhodes grass. The gravel plain area is not currently used for any research purposes and local herders are allowed to graze their animals in the enclosure. This is potentially a good site for rangeland research in a gravel plain eco-system (although probably not quite large enough). We then visited Shinaz Extension Service in search of a grass called 'Humaira' which, according to some sources in the Ministry has great potential for use as a forage. 'Humaira' turned out to be an annual grass and therefore oflittle immediate importance. Shinaz is predominantly a tobacco and vegetable growing area with sweet water. We returned to Sohar and met with the Director of Agriculture Research of the Batina area, Saoud Al-Harthy, who was very enthusiastic about genetic resource activities. He joined us in collection on a single site close to Sohar. Much of the area behind the coast in Batina is gravel plains, dominated by annual grasses and not appropriate for our target species. We did however find a single site in a slight depression known as Wadi Hibi where we collected seed of 8 species. Failing light forced us to abandon collection. We stayed in the Ministry Guest House.

24 March	We left early to complete our collection at the site adandoned the previous evening. We then collected within Majees Forest, an irrigated planted forest which has been protected for eight years. This was rather disappointing in terms ofthe abundance of our target species. Atriplex leucoc/ada was present although not flowering or seeding. On our way to Gathanfan we passed a couple ofladies harvesting Cenchrus ciliaris from the wild, one of our target species. We met up once more with our counterpart and headed towards the salt flats behind the beach. We traveled through a particularly overgrazed area dominated by Acacia tortilis and annual grasses. We stopped several times, but none of our target species were found. On the salt flats, an area dominated by Halopeplis perfoliata, we were able to collect several of our target species and noted the presence of Atriplex leucoc/ada. There were small populations of Panicum turgidum where sand had collected. We then went inland towards the UAE border, into the mountain area, dominated by Acacia sp. and Ziziphus spina¬christi. This area was very disappointing in terms of our target species. We slept at the DAR Guest House in Sohar.
25 March	We joined an agricultural extension meeting being held in Mahab, a mountain village. Here, we talked to farmers about preferred browse species. We collected a number of herbarium specimens and some seed. Farmers identified Convolvulus virgatus, Leucas iriflata, Taverniera glabra, Fartesia linear is, Heliotropium "(;alcareum (mature at the end of April), Achyranthes aspera and Panicum turgidum as being important species. They said that Lycium shawii, a species on our target list, was not grazed, but Jaubertia aucheri and Ochradenus aucheri were browsed in preference j. We returned to Rumais.
26 and 27 March	The- planned trip was cancelled at the last minute due to logistic problems (weekend).

28 March	We drove to Nizwa and met with Masood Al-Adawi, our counterpart for the next two days. He had attended the ICARDA/IPGRI 'Germplasm Collection and Maintenance Course' in Sharjah and Dubai. We also met the DG ofthe DGAR (Interior Region), Mr. Saleh Al-Abri, and discussed germplasm collection activities. We travelled towards the Central desert, across a large gravel plain dominated by Acacia tortilis and Rhyza stricta. We collected in a shallow wadi near Adam. Here we found five of our target species and noted that some plants of a particular species, such as Lasiurus - scindicus, were heavily grazed whereas others were not. Seeds were not available from those plants which were heavily grazed so we collected from the ungrazed plants which were possibly less palatable. It is important that sections of the heavily grazed plants are transplanted to protected nursfries for propagation and seed collection. Jaubertia aucheri and Pennisetum divisum were only lightly grazed. We collected at another, similar site close to Nizwal The abundance of vegetation in slight depressions (wadis) is remarkable, compelred to the surrounding plain. This suggests a substantial potential for water harve_ting. Stayed in Nizwa.
29 March	Made our way back to Muscat and collected at three sites along the way. In the mountainous area we collected in a couple of deep wadis. Here Convolvulus virgatus, Crotalaria aegyptiaca, Lasiurus scindicus, Farsetia linearis were heavily browsed. Ochradenus aucheri and 0. arabicus were browsed to a lesser extent. We also collected in a shallow, partially protected wadi just outside Muscat where amongst other species Polygala mascatense, Commicarpus helenae and Barleria hachstetteri appeared to be browsed.
30 March	Bilal Humeid, Genebank Manager, ICARDA was introduced to relevant people at DGAR, Rumais. He was shown the building to be converted to a genebank. Together we attended a meeting with the engineering consultant to discuss genebank construction. The collection team drove 4hrs to Sur, to begin germplasm collection the following morning.

31 March	MetwithKhalife,DGDGAR(Sharqiyah)andSuleimanCanender in Kamil. We drove into the north-eastern edge ofWahiba Sands. Vegetation was sparse and the area heavily overgrazed. Cyperus conglomeratus, which is usually never touched by animals, was grazed. We collected two Calligonum species, C. comosum and C. crinitum subsp. arabicum and Euphorbia riebeckii, which appeared to be heavily grazed. Extensive 'lopping' of Prosopis cinerea and overgrazing, which prevents the establishment of new young trees, has severely diminished the forests in this area. The remaining forests are severely threatened. This area was targeted by the Forestry Department of DGAR before financial constraints halted activities. Target areas are already staked out, but limited resources prevent conservation and rehabilitiation activities. This should be considered as a possible priority area for ICARDA-APRP activities. We collected Lasiurus scindicus and several other species in an inland sabkah (salt pan), although much seed had already shattered. We continued to a gravel plain area close to Al-Ashkharah which was dominated by Dipterigium glaucum. Much of the seed in this area however had already dispersed. We spent the night in Sur.
1 April	We made our way back from Nizwa to Muscat, stopping at several shallow wadis along the way. Again, these wadis supported abundant vegetation and several species were collected, although most of the seed of Cenchrus ciliaris and Pennisetum divisum had already dispersed. Dipterigium glaucum is prolific along this road.
2 and 3 April	Weekend
4 April	Went to the National Herbarium to identify herbarium specimens and take photographs in order to compile a 'Flora' of browse species. The National program expressed a strong wish for an identification aid to selected indigenous browse species. It appeared that a guide consisting on photographs of herbarium specimens was the most immediate, easy-to-use and informative solution. An identification booklet to 48 species was left with the DGAR. This booklet needs to be expanded and modified in light of new information. DGAR prepared the seed for Bilal to take to ICARDA, Aleppo.

5 April	Divided the herbarium specimens between ICARDA-APRP, DGAR and the National Herbarium. MF had summing up meetings with Dr. Sharma and Ali Al-Jabri during which follow-up activities were discussed.
6 April	02.25 return to Dubai

Discussion

The number of accessions of each species collected is shown in Table 1. Herbarium specimens were taken to accompany each seed sample collected. Identification was confirmed by Dr. Shahina Ghazanfar, Botanical Consultant based in Oman. Herbarium specimens were also taken in order to identify unknown species which may be of interest as browse species and to define the distributional range of target species for which seed was unavailable. A list ofthese species is given in Table 2.

At each site soil samples were taken to help define the ecological preferences of each species. All samples will be analysed by DGAR. The precise latitude and longitude of each site was also recorded.

All the seed was sent to the Genetic Resources Unit, ICARDA, for 'blackbox' storage, until suitable storage facilities become available within the Arabian Peninsula.

A database has been compiled of all collection passport data and a photographic Flora produced to assist in rangeland species identification. In addition a database of 152 rangeland plants, which have been brought to my attention by farmers, herders and scientists, has been developed. This includes information concerning biological characteristics and potential use in forage production, rangeland enhancement and lor rangeland rehabilitation. This database has been used to produce the current 'target species' list (Tables 4 &' 5). The database includes 27 species of high priority, 39 of medium priority, 60 of low priority and 26 of unknown potential (but likely to be low).

Two Omani national scientists were thoroughly trained during the mission in germplasm collection techniques and a further five Omani nationals were given a basic training (one or two days).

Recommendations

- One person from DGAR is made responsible for all genetic resource activities.
- Indigenous knowledge is collected regarding both rangeland fodder and forage crops. This will help us to defme target species.
- Specific ecosystems, where our efforts may have the greatest impact, should be

identified, together with their extent and distribution. This will further help us define target species.

- Ways in which these species may be introduced into farming systems should be considered. Additional collections are done in the area already covered now that a more focused target list has been devised (see Tables 4 & 5).
- The photographic Flora be extended to include all species in the latest high and medium priority; target species list.
- The collection form be translated into Arabic.
- Collections of target species that mature later in the year be carried out.
- The National Herbarium in Oman is consulted regarding the forage or browse potential of the 'unknown' species in the database of rangeland species.
- Collection is carried out in Dhofar in September or October when the seed of most species should be mature (see Figure 2).

Table 1: The number of accessions of each species collected in the Sultanate of Oman in 1998

No of Accessions	Genus	Species	Subspecies
2	Asphodelus	tenuifolius	
1	Calligonum	comosum	
1	Calligonum	crinitum	arabicum
7	Cenchrus	ciliaris	
1	Cenchrus	setigerus	
5	Crotalaria	aegyptiaca	
2	Cyperus	conglomeratus	
5	Dichanthium	foveolatum	
5	Dipterigium	glaucum	
1	Farsetia	Linearis	
1	Heliotropium	Kotschyi	
2	Indigofera	intricata	
1	Kohautia	retrorsa	
7	Lasiurus	Scindicus	
1	Lasiurus/ Crotalaria	Scindicus/ aegyptica	
1	Lotus	garcinii	
1	Ochradenus	arabicus	
4	Ochradenus	aucheri	
1	Ochtochloa	compressa	

3	Panicum	turgidum
6	Pennisetum	divisum
1	Polygala	erioptera
2	Sporobolus	ioclades
1	Sporobolus	spicatus
1	Stipagrostis	plumosa
1	Tephrosia	apollinea
2	Ziziphus	spina- christi
68 TOTAL		

Table 2. Identification of herbarium specimens collected in the Sultanate of Oman in 1998

No. of specimens	Genus	species	Var.
1	Achyranthes	aspera	
1	Arthrocnemum	macrostachyum	
1	Astragalus	fatmensis	
1	A triplex	leucoclada	Var.inamoena
1	Barleria	hochstetteri	
1	Blumea	cf. bovei	
1	Cenchrus	ciliaris	
1	Commicarpus	helenae	
2	Convolvulus	virgatus	
1	Cyperus	conglomeratus	
1	Dipterigium	glaucum	
1	Euphorbia	riebeckii	
1	Farsetia	linearis	
1	Heliotropium	calcareum	
2	Launaea	intybacea	
1	Leucas	injlata	
1	Limonium	stocksii	
1	L ycium	shawii	
1	Polygala	mascatense	
1	Taverniera	glabra	
1	cf. Panicum	turgidum	
1	Unidentified		

Table 3: Revised target species list for collection in the Sultanate of Oman, produced from a compilation of target species identified by farmers, Dr. Henry Le Houerou and Dr. Shahina Gazanfar. This list was further revised according to observations made during the collection mission (see Table 4)

List compiled 22nd March 1998

Perennial grasses

Aeluropus lagopoides
Aristida sp.
Cenchrus ciliaris
Centropodia forsskalii
Coelachyrum piercei
Dactyloctenium
Dichanthium foveolatum
Eragrostis sp.
Lasiurus scindicus
Ochthochloa compresa
Panicum turgidum
Pennisetum divisum
Phragmites
Sporobolus spicatus
Sporobolus virginicum
Sporobolus ioc/ades
Stipagrostis plumosa
Stipagrostis sokotrane

Trees, shrubs and perennial herb species

Acacia tortilis
Acacia gerardii
Acacia ehrenbergiana
Acacia nilotica (arabica)
Boerhavia elegans
Boerhavia repens
Calligonum comosum
Cretonia oreothaum subsp. oreothauma
Commicarpus boissieri (and other species)
Cornulaca aucheri
Cornulaca monacantha
Cressa cretica
Dipterigium glaucum
Halopeplis perfoliata
Jaubertia aucheri
Lycium shawii

Maerua crassifolia
Olea europaea
Prosopis cineraria
Reseda muricata
Reseda aucheri
Salsola rubescens
Ziziphus spina-christi
Ziziphus hajarensis

Others of potential interest:

Avicennia marina (mangrove)
Chenopodium album (annual)
Ochthochloa compressa (annual grass)

Table 4: Revised list of those target species presented in Table 3. This new list was compiled according to observations and discussions with farmers, herders and scientists both in the UAE and the northern part of the Sultanate of Oman. It is relevant to both the UAE and Northern Oman.

High Priority (Total 27 species)

Grasses (10 species)

Cenchrus	*ciliaris*
Cenchrus	*setigerus*
Coelachyrum	*piercei*
Dichanthium	*foveolatum*
Ochtochloa	*compressa*
Sporobolus	*ioclades*
Sporobolus	*nervosus*
Sporobolus	*virginicus*
Stipagrostis	*plumosa*
Stipagrostis	*sokotrana*

Grass shrubs (2 species)

Lasiurus	*scindicus*
Panicum	*turgidum*

Shrubs and trees (15 species)

Acacia	*ehrenbergiana*
Acacia	*gerardii*
Acacia	*nilotica*
Acacia	*tortilis*
Calligonum	*comosum*

Calligonum	*crinitum*	*subsp. arabicum*
Ceratonia	*oreothauma*	*subsp. oreothauma*
Convovulus	*virgatus*	
Cressa	*cretica*	
Crotalaria	*aegyptiaca*	
Dipterigium	*glaucum*	
Heliotropium	*digynum*	
Maerua	*crassifolia*	
Prosopis	*cinerea*	
Rhanterium	*epapposum*	

Table 5: Medium priority species (total 39 species)

<u>Grasses (11 Species)</u>

Aeluropus	*Lagopoides*
Aristida	*triticoides*
Centropodia	*forskalii*
Centropodia	*fragilis*
Eragrostis	*cilianensis*
Eragrostis	*ciliaris*
Euphorbia	*riebeckii*
Halopyrum	*mucronatum*
Stipagrostis	*ciliate*
Stipagrostis	*paradisea*
Stipagrostis	*raddiana*

<u>Grass Shrubs (1 species)</u>

Pennisetum	*divisum*

<u>Herbs, Shrubs & trees (27 species)</u>

Achyranthes	*aspera*
Asphodelus	*tenuifolius*
Barleria	*hochstetteri*
Commicarpus	*boissieri*
Commicarpus	*helenae*
Cornulaca	*aucheri*
Cornulaca	*monocantha*
Farsetia	*aegyptiaca*
Farsetia	*linearis*
Gymnocarpus	*decandrum*
Halopeplis	*perfoliata*
Heliotropium	*calcareum*
Jaubertia	*aucheri*
Leptadenia	*pyrotechnica*

Leucas	*inflate*
Ochradenus	*arabicus*
Ochradenus	*aucheri*
Olea	*europaea*
Periploca	*aphylla*
Polygala	*erioptera*
Polygala	*mascatense*
Reseda	*aucheri*
Reseda	*muricata*
Salsola	*rubescens*
Taverniera	*glabra*
Ziziphus	*hajarensis*
Ziziphus	*spina-christi*

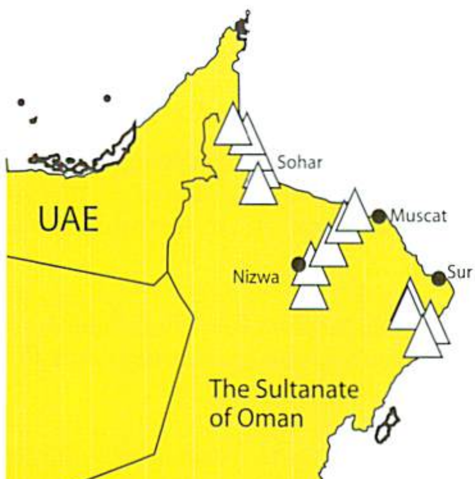

Figure 1: Location of germplasm collection sites in the Sultanate of Oman, in 1998.

Annex II

Forage and range germplasm collection in Dhofar, Oman (November 8-18, 2001)

By Ahmed E.Osman

As part of ICARDA-Arabian Peninsula Regional Program (APRP) activity with the Sultanate of Oman a collection mission for rangeland germplasm was organized in Dhofar Province in the period November 8 to 18, 2001. A similar mission was supported by ICARDA-APRP in 1998 for the Sohar region in Oman. The germplasm materials collected then are being evaluated within the collaborative program between the Sultanate and ICARDA-APRP, for their forage value and water use efficiency, with the objective of replacing the 'water-hungry' exotic forages in the Sultanate. Participants in the mission were Ali Shehade (ICARDA-GRU, Aleppo); Ahmed Osman (ICARDA-APRP, Dubai); Saleem Nadaf, Salih Al Hinahi and Safa'a Al Farisi (Research & Extension Ministry of Agriculture, Rumais, Oman). From Salalah (Range and Forest group) participated: Saeed Bin Masoud Al Omari (local coordinator), Ahmed Awad Bakeir, Mohamed Bin Mahad Al Awaeid, Salem Bin Mosalam Geid, Ahmed Suhail Al Marhoun, Msalam Ali Hardan and Ahmed Mosalam Al Amri.

Itinerary

November 8

Ali Shehada who arrived the day before from Aleppo Syria joined me on the ride from Dubai to Oman by car, arriving Novotel Seeb Hotel in the afternoon (close to Seeb International Airport and not too far from Rumais Research Station).

November 9

Met Saleem Nadaf and Salih Al Hinahi from Rumais at Seeb Airport and flew to Salalah. The other participant (Safa'a Al Farisi) took another flight late in the day.

November 10

A short meeting was held at the Agricultural Directorate with Eng. Mosalam Ahmed Bin Suhail Tabouk Assistant DG, Agricultural Directorate. The participants from Salalah: Saeed Bin Masoud Al Omari (local coordinator), Mohamed Bin Ali Al Awaid and Ahmed Awad Bakir (Eastern region); Ahmed Bin Gamaan Al Marhoun (Central region); Mosalam Bin Faraj Ali Hardan and Ahmed Mosalam Al Amri (Western region) joined the meeting. The meeting discussed and agreed on the general plan for the filed visits. The group of participants then moved to the Range and Forestry Building where the details of the mission were reviewed. Maps, Flora of Dhofar and Herbarium were checked. Field tools, pressing boards, old news papers, GPS, Campus, bags, tags scissors were prepared. For the purpose of this mission the Directorate provided two to three pickups everyday for the field trips.

November 11

Accompanied by the range and forest staff: Saeed Bin Masoud Al Omari (local coordinator), Mohamed Bin Ali Al Awaid and Ahmed Awad Bakir we drove east of Salalah for about 40 km in the direction of Taqah (29 km) before turning north to our first stop at Wadi Dirban. The site is characterized by a permanent spring and crowded with camels and cattle. The pasture has been grazed to the ground and it was clear that the animals were relying on hand feeding. Sogot (Anogeissus dhofarica) and sidr (Ziziphus spina-christi), which are the most dominant tree species, are showing clear demarcation of the grazing line. Camels unable to reach for the high branches of the trees have turned into grazers on what ever they find on the ground (Figure 1). Nevertheless the site is showing a wide diversity of species especially the trees. The grasses that are mostly annuals (Al aali Themeda quadrivalis and Al shipzaph Apluda mutica) have been grazed to the ground.

Figure 1. Grazing line on trees created by camel browsing and (in the insert picture), a Camel unable to reach for branches is reaching for what ever it can find on the ground.

The pasture was in great need for reducing the stocking rate (currently 2 to 3 times its carrying capacity) in order for it to recover. Enclosure at Tawi Ateir our next stop (few km from Wadi Dirban site) is showing excellent recovery of Themeda quadrivalis and Apluda mutica both are highly palatable. At Tawi Ateir enclosure we noticed beside the annual grasses, the presence of a palatable perennial grass 'zadrut' Dichanthium aristatum. The enclosure also contained several trees of 'thour' Acacia senegal, which were planted.

We stopped at the office of the governor of Tawi Ateir who expressed concerns over the range degradation and he is looking forward to see the government plan for reducing the current camel numbers by purchasing the excess animals from herders. We then traveled east on Jebal Samhan for our next stop at 1255m altitudes. The area is also degraded but the stunted shrubs 'Tashgout' Euphorbia balsamiphora is dominating the seen. The local people use this tree for producing gum 'Elka' by squeezing the juice 'milklike' from the branches. Present also was 'Halqoum' Solanum incanum which is considered an indicator of overgrazing. Another non-palatable tree, which was noticed here and later on encountered in other locations in Dhofar, was 'Sheraz' Dodonaea angustifolia.

At a lower elevation (1014m) we came across a good stand of 'Qarat' Acacia nilotica subspecies indica. We also noted an interesting climber plant, which is destroying other shrubs by climbing and smothering them. It is known locally as 'Itra' Cissus quadrangularis (Figure 2) Apart from heavy grazing those weedy species 'Itra' and 'Sheraz' are becoming a threat on the range, which need a quick action like what has been taken for Mesquite Acacia juliflora (Prosopis juliflora). The species was introduced by the municipality but turned into a very serious weed, which had to be destroyed following a decree from H.H., the Sultan late 2000. The fight against Mesquite is still progressing. The two more stops on the range before sunset: at Karhanut (longitude: E 54 38 12, latitude: N 17 06 49) and Wadi Hashir (longitude: E 54 36 33 and latitude: N 17 03 12) confirmed the previous seen of overstocking. The noticeable Acacia species 'talh' Acacia geradi, 'geirat' Acacai nilotica subspecies indica seems have already contributed their share of the animal feed judging by the camel grazing line on them.

Figure 2. Several unwanted species are now spreading on the range 'Itra' Cissus quadrangularis is the most serious one climbing and smothering Acacai species.

November 12

Accompanied by: Saeed Bin Masoud Al Omari and the two staff from the central region (Salem Bin Mosalam Geid, Ahmed Suhail Al Marhoun) we traveled north of the Salalah on the road to Muscat, turning left before Heiritti to visit an enclosure at Hajif about 18 km north of Salalah. Rainfall is about 200 mm, yet perennial grasses 'dafeid' Dyschoriste dalyi and 'kazareit' Dactyloctenium scindicum and 'zadrout' Dichanthium aristatum were able to flourish and produce seeds under the protection from grazing inside the enclosure.

November 13

Visiting the western region for two days (13&14) we were accompanied by Saeed Bin Masoud Al Omari, Msalam Ali Hardan and Ahmed Mosalam Al Amri. Our first stop was Shahab Isaeib (Geishan Mountains) altitude 1065m, with low rainfall (less than 100mm). The characteristic species noted was 'airoub' Dracaena serrulata, which was heavily browed on by camels. The tree produces fibrous leaves similar to sisal, which was popular in the past for rope making by local inhabitants. The other tree species 'saab' Acacia etbaica is scattered on the slope. Perennial grasses were surviving on water harvesting by the roadside: These include 'zadrut' Dichanthium micranthum, ahier' Loudetia flavida and 'kazareit' Dactyloctenium scindicum. We stopped on our way at a veterinary center belonging to the Ministry of Agriculture. A man in his fifties told that in the old days the whole area around there was covered by trees, but he added due to the increased camels number are all gone. Our second stop was Anatokh (longitude:E 53 20 07; latitude: N 16 46 12, 18 and Altitude of 850 m). A new road is being constructed (30 km) linking the main highway to the coastal town of Rakhut. The area is enjoying a relatively high rainfall 300 mm, but more importantly low animal population probably due to the rough terrain. Here the most dominant trees are 'Sogot (Anogeissus dhofarica), 'khair' (Ormocarpum dhofarense) which our local companions described as very palatable to all livestock. Well represented also was 'aayloub' Belepharis dhofarense, 'khofout' Belepharispermum hirtum and 'thour' the gum Arabic tree Acacia senegal. Our last stop before sunset was to examine an enclosure at Ambroof, 12 km from the coastal town of Anatokh. The grasses of Apluda mutica and Themeda quadrivalis were up to two meters high. The only tree species was 'qatait' Ficus sycomorus. It is interesting to note that these enclosures are opened every year for local people to harvest the forage. This is done at the end of the season after taken plant measurements and after seed collection. By so doing a good relation is maintained with the herders. Our night stay was at a guesthouse provided by the governor of Rakhut.

November 14

Back to the main road we continued west towards the Yemen boarder, then into a narrow road towards the coastal town of Dalkut. Our stop before Dalkut was Wadi Saiq (longitude E 53 13 06 and latitude N 16 45 03). Rainfall was not more than 150 but the area supports many tree species: 'qarad' Gerwia bicolor; 'shebhait' Premna resinosa; 'thour' Acacia senegal and A. laeta. At Dalkut we were welcomed by the Assistant Governorate (the Governor was out on a trip), who spoke of the Governorate concern over the spread of the weedy shrub 'sheraz' Dodonaea angustifolia which he feels if nothing is done it will create a similar problem like Prosopis juliflora (Acacia juliflora) in the eastern part of the province which is now being actively controlled by uprooting.

November 15

Meeting at the Directorate of Agriculture, going over the information collected, seeds, herbaria and soil samples. Present were: Saeed Bin Masoud Al Omari, Saleem Nadaf, Salih Al Hinahi, Msalam Ali Hardan, Ali Shehade and Ahmed Osman. At the end of the day we visited the tree garden, which contain over 90 species, collected from the different areas of province and present a valuable source of seeds for these trees.

November 16

A rap up meeting was held at the Hotel with Eng. Mosalam Ahmed Bin Suhail Tabouk Assistant DG, Agricultural Directorate. We provided a summary of the trip and our recommendations for future activities. The main areas discussed included seed collection and storage, maintenance of seed viability through proper storage facilities, rehabilitation work on degraded rangeland, In-situ conservation of genetic material, and training of support staff. We left Salalah late afternoon for Muscat.

November 17

A final meeting was held at Rumais Station, where herbaria were split into two leaving one half for Oman. Due to lack of proper germplasm storage facilities in Oman the seeds collected in Dhofar were send with Mr Ali Shehadeh for storage at ICARDA Genebank after phytosanitary papers were issued. A Field visit was made to the animal research station with Dr Abdul Mohsen Al Nadi (water relation expert) to see experimental plots assessing water use by different forages including two indigenous species (Cenchrus ciliaris and Coelachyrum piercei). Sprinklers are irrigating the plots and germination has just started. Settlement was made for outstanding bills for Air tickets.

November 18

Back to Dubai by car

Summary of activities

The mission was guided by the list of species provided by Oman researchers as priority (Table 1). As agreed in a previous meeting ICARDA-APRP contributed:

- Two scientists
- Airline return tickets Muscat-Salalah for five participants

Also provided (on loan basis):

- GPS units (three)
- Pressing boards (ten)
- Two Cameras (one movie)

The Ministry of Agriculture and Fisheries contributed:

- One senior scientist and nine technicians
- Cars/fuel during the mission (2-3)
- Accommodation and perdiems of participating national staff.

At each site soil samples were taken to help describe the site. The samples will be analyzed at the soil laboratory at Salalah for physical and chemical characteristics. Herbaria samples were taken at all sites while seeds were collected in most sites. The Herbaria were split between Rumais and ICARDA-Dubai, while all the seeds were sent to the Genetic Resources Unit, ICARDA, for 'blackbox' storage, until suitable storage facilities become available within the country.
A database has been collected for passport data in all sites, which will be used for Herbaria samples.

On the job training was provided for all support staff during the mission in all aspects of germplasm collection, use of GPS and in the handling and storage of Herbaria samples (Figure 3)

Figure 3. On the job training for Omani Researchers on various aspects of germplasm collection

Discussion and Recommendations

Dhofar province consists of many ecological niches created by the topography rainfall and condensation. The Salalah plain receives a mean annual rainfall of 100mm but a few kilometers to the north; the mountains receive up to 500 mm. The escarpment and plateau receive dense mists during the Kharif, where condensation is a major source of moisture for the vegetation. The large numbers of camels, cattle and goats quickly consumes the lush growth of the range during the 'kharif'. Both herders and government officials mentioned the problem of overstocking during our mission, and it was clearly demonstrated by the grazing lines on the trees (Figure 1), and by camels turning into grazers for what ever they find on the ground. Camels normally browse on tree-branches. The tree-barks have also been eaten up by camels in some cases, which could lead to death of these trees. Many of the sites visited are in immediate need for de-stocking if they have to recovery. Annual grasses are the dominant species, suggesting that perennial grasses especially in areas of high rainfall have been eaten up. Attempt for reseeding of the range was tried at Tawi Ateir in 1996 but failed due to open grazing.

Based on our field visits and discussions with government officials and herders the following recommendations are suggested:

- The stocking rate on the range is currently estimated at 2-3 times the carrying capacity, every effort need be given to reduce animal numbers. Without such step no range improvement program can succeed. The government program to create a market for excess animals is the only hope in the horizon.
- Range enclosures (currently about 25) are providing useful information on the

potential for rangeland recovery. Also they are important for seed collection. The numbers of these enclosures need to be increased (doubled) for In-situ conservation of biological diversity on the rangelands of Dhofar

- Currently the enclosures are opened for the herders at the end of each season. The new enclosures (10m x 10m) should be kept closed for a longer time in order for perennials (grasses) to recover and establish.
- The tree garden behind the building of the Agricultural Directorate, comprising over 90 tree and shrub species is important source of seeds for these species. A similar field need be established for seed multiplication of important range grasses. Large seed quantities will be needed if rehabilitation programs for the degraded rangelands are to be attempted.
- Small quantities of seeds of range plants are currently stored at room temperature. Proper cold storage facility is needed if seeds are to be stored for long time.
- Staff working on range/forestry are under the Agricultural Directorate (The Range Directorate was moved to Muscat in 1999) have received training (Diploma) in forestry and range work. They are in need of more training on all aspects of seed production, seed and herbaria storage and maintenance.
- A vacuum seed collector is available, but seed threshers and cleaners are lacking. ICARDA-APRP is providing seed scarifiers and seed cleaner equipments for the Sultanate of Oman. The seed multiplication efforts at Salalah can benefit from these facilities.

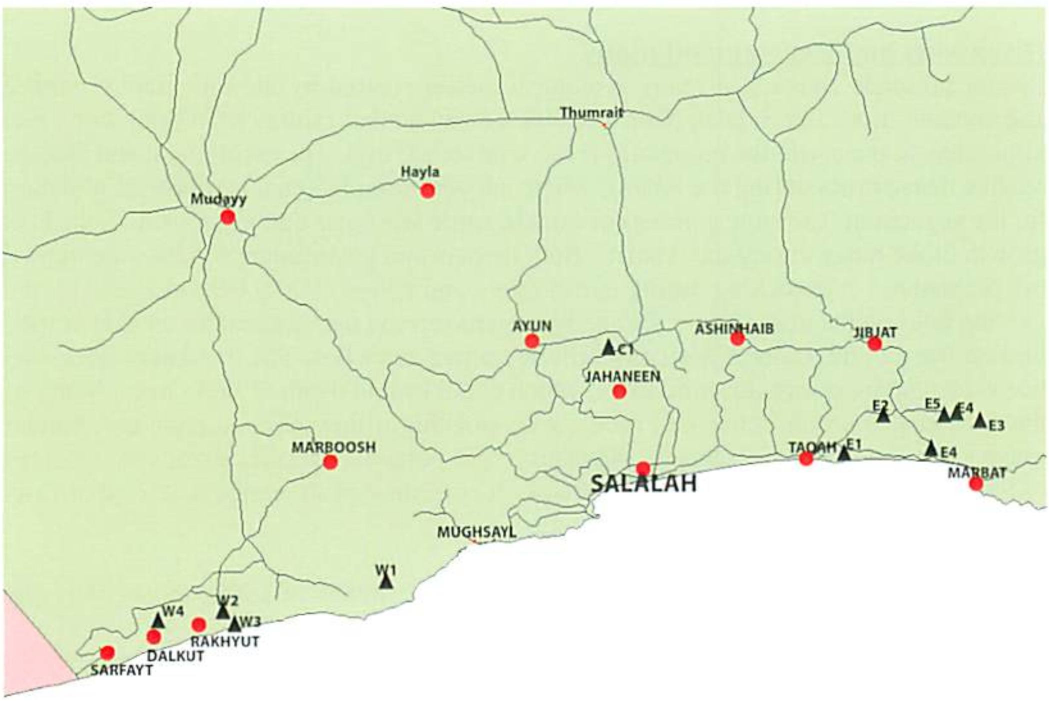

Figure 4. Map showing germplasm collection sites (▲) in Dhofar province during November 2001.

Table 1: List of target species as suggested by the Omani researchers for the collection mission in Dhofar, November 2001.

Multipurpose fodder trees and shrubs	**Grasses**
Acacia gerardi	*Apluda mutica.*
Acacia laeta	*Aristida spp.*
Acacia nilotica	*Cenchus spp.*
Acacia oerfota	*Dactyloctenum spp*
Acacia senegal	*Dichanthium spp*
Acacia tortilis	*Dyschoriste dalyi*
Allophytus rubifolius	*Loudetia flavida*
Anogeissus dhofarica	*Panicum spp.*
Cadaba spp	*Vigna radiata*
Euclea schimperi	*Setaria spp.*
Ficus spp	*Themda quadrivalis*
Grewia spp.	
Maytenus spp	
Moringa peregrina	
Phamnus staddo	
Prosopis spp.	
Tamarindus indica.	
Tamarix aphylla.	
Ziziphus spp.	

Table 2: Identification of herbaria collected in Dhofar province November 2001

Trees and shrubs

Acacia etbaica
Acacia gerardi
Acacia nilotica (subspecies indica)
Acacia laeta
Acacia Senegal
Anogeissus dhofarica
Belepharis dhofarense
Belepharispermum hirtum
Dodonaea angustifolia
Delonix elata
Dracaena serrulata
Euphorbia balsamiphora
Ficus vasta
Ficus sycomorus
Gerwia bicolor
Maytenus dhofarensis

Ormocarpum dhofarense
Premna resinosa
Tamrindos indica
Zizyphus spina-christi

Grasses
Apluda mutica
Cenchrus sp.
Cyprus rotundus
Dactyloctenium scindicum
Dichanthium micranthum
Dichanthium aristatum
Dyschoriste dalyi
Loudetia flavida
Seteria sp.
Themeda quadrivalis
Trigonella sp.

Table 3: Number of accessions of each species collected in Dhofar, Sultanate of Oman in November 2001

Trees and shrubs Grasses and Legumes

Acacia etbaica	*1*
Apluda mutica	*2*
Acacia gerardi	*1*
Cenchrus sp.	*1*
Acacia nilotica (subspecies indica)	*1*
Dactyloctenium scindicum	*1*
Acacia laeta	*1*
Dichanthium aristatum	*1*
Acacia Senegal	*2*
Dyschoriste dalyi	*1*
Anogeissus dhofarica	*2*
Loudetia flavida	*1*
Belepharispermum hirtum	*1*
Seteria sp.	*1*
Euphorbia balsamiphora	*1*
Themeda quadrivalis	*2*
Ormocarpum dhofarense	*1*
Trigonella sp	*1*

The main approach used by ICARDA's Arabian Peninsula Regional Program (APRP) to address the problem of degraded rangelands, shortage of feed for livestock, and limited water for irrigated forages, lies in the utilization of adapted indigenous forage species. Collection missions were carried out with the national programs of different countries in the Peninsula. This publication documents the genetic materials collected in the region from 1998 to 2004, and provides passport data for those collections. Some of the species collected have been found to be valuable as forage crops with high water-use efficiency, a feature that is extremely useful in the dry areas

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