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# Plant diversity in Marmarica (Libya & Egypt): a catalogue of the vascular plants reported with their biology, distribution, frequency, usage, economic potential, habitat and main ecological features, with an extensive bibliography

HENRY NOËL LE HOUÉROU

## ABSTRACT

LE HOUÉROU, H. N. (2004). Plant diversity in Marmarica (Libya and Egypt): a catalogue of the vascular plants reported with their biology, distribution, frequency, usage, economic potential, habitat and main ecological features, with an extensive bibliography. *Candollea* 59: 259-308. In English, English and French abstracts.

Marmarica, as it is called since antiquity, is the natural region located between the Jebel Lakhdar of Cirenaica and the Nile Delta over an E-W distance of 750 km. It covers an area of 220 000 km<sup>2</sup> along the southern shore of the Mediterranean Sea between longitudes 23°E and 30°E. It is a typically Mediterranean arid zone in the northern fringe along the shoreline, shifting slowly to absolute desert southwards on a depth of ca. 300 km. Mean annual rainfall is slightly below 200 mm in the northernmost sites dropping to 10 mm at the oases of Jarabub and Siwa 300 km further south. The flora belongs to the Ibero-Maghribian entity of the Mediterranean phytogeographic region with some Saharo-Arabian and Irano-Turanian elements. It includes an overall 1015 vascular taxa representing 48% of the Egyptian flora and 53% of the Libyan flora. Eighteen taxa are endemic to the region. Flora and vegetation are very homogenous and strongly influenced by 3 types of farming: 1) irrigation between Alexandria and El Alamein (ca. 100 km W of the Nile); 2) runoff farming in the valleys along the wadis of the coastal plains with episodic mixed dry farming of cereals; 3) grazing on fallow, stubble and the depleted steppes on the interfluves. Vegetation and flora are strongly influenced by the impact of man: virtually all of the pristine steppe vegetation still present, and mapped in the years 1960's have now been cleared for opportunistic farming. This situation has heavily imprinted on the flora and vegetation now dominated by «weeds». The present study presents a catalogue of the native taxa reported in both the Libyan and Egyptian part of Marmarica with their biology, abundance, frequency of occurrence, geographic distribution, economic and grazing potential, utilization and ecological requirement traits in terms of climate and soils. An extensive bibliography is provided.

## RÉSUMÉ

LE HOUÉROU, H. N. (2004). Diversité botanique de la Marmarique (Libye et Egypte): catalogue des plantes vasculaires inventoriées avec leur biologie, répartition, fréquence, usage économique, habitat et caractéristiques écologiques principales, suivi d'une bibliographie étendue. *Candollea* 59: 259-308. En anglais, résumés anglais et français.

La région naturelle de Marmarique, connue sous ce nom depuis l'Antiquité, est située entre le Jebel Lakhdar de Cyrénaïque et le delta du Nil sur une distance O-E de 750 km. Elle couvre une aire de 220 000 km<sup>2</sup> le long de la côte sud de la Méditerranée entre les longitudes 23°E et 30°E. Elle se présente comme une zone aride typiquement méditerranéenne dans sa partie nord le long de la côte, évoluant progressivement vers un désert absolu sur une distance d'environ 300 km. La pluviosité

moyenne annuelle est légèrement au-dessous de 200 mm dans les sites situés le plus au nord pour descendre progressivement à 10 mm dans les oasis de Jaraboub et de Siwa, situées à 300 km plus au sud. La flore appartient à l'entité phytogéographique ibéro-maghrébienne de la région botanique méditerranéenne avec quelques éléments saharo-arabiques et irano-touraniens. Elle comprend un total de 1015 taxa vasculaires représentant 48% de la flore égyptienne et 53% de la flore libyenne. Dix-huit taxa sont endémiques de la région. La flore et la végétation sont zonalement très homogènes et fortement influencées par la culture. Les cultures sont de trois types: 1) cultures irriguées d'Alexandrie à El Alamein à environ 100 km à l'O du Nil; 2) cultures arbustives avec utilisation du ruissellement le long des oueds dans la plaine côtière; 3) cultures sèches épisodiques de céréales avec des jachères pâturées sur les interfluves jusqu'à environ 50 km au S de la côte, là où le sol le permet. Les sols squelettiques superficiels à croute calcaire constituent un pâturage généralement très dégradés. La végétation originelle, encore présente dans les années 1960, a maintenant été défrichée au profit de cultures céréaliers opportunistes. Cette situation se répercute sur la flore et la végétation maintenant largement dominées par des «mauvaises herbes». La présente étude est un catalogue des taxa présents en Marmarica tant libyenne qu'égyptienne, avec des indications sur leur biologie, répartition géographique, fréquence, et leurs principales exigences écologiques en matière de climat et de sols, leur utilisation actuelle, leur potentiel économique et pastoral. Une bibliographie étendue est fournie.

**KEY-WOROS:** Mediterreanean – Arid lands – Land-use – Steppe – Rangeland – Desert – Sahara – Libya – Egypt – Phytogeography – Flora – Vegetation – Ethnobotany

## 1. Introduction: the geographic setting

The geographic natural region known since antiquity as Marmarica encompasses the land located immediately south of the Mediterranean Sea between longitudes 23° and 30°E, i.e. from 40 km E of Derna and Cyrenaïca's highlands to Alexandria and the Nile Delta. The region extends from the shore line (lat 31° to 32.5°N) to the oases of Jarabub and Siwa (ca. lat 29°N) some 300 km further south in the inland desert (Map 1).

Marmarica is a very homogenous region on many accounts from the stand points of climate, geology, geomorphology, flora and vegetation. Marmarica thus appears as a self contained ecologic and biogeographic unit split in two uneven parts by the political border between Libya and Egypt. The region as a whole covers ca. 220 000 km<sup>2</sup>, 2/3 of which are in Egypt and 1/3 in Libya. A detailed zoning is shown in § 4.2, 'area of distribution'.

From the geomorphic standpoint one may distinguish:

The shoreline generally covered with marine white dunes lying on a upper Pliocene and Holocene more or less consolidated beach of *Strombus bubonius*. The width of the dune zone may reach one km and locally more. Their height may reach 20 m and locally more. Some salt marshes may interrupt the duney offshore lines. The salt marshes are generally tied to the lower reaches of the main wadis. The area covers an area of some 750 km<sup>2</sup>.

The coastal plain, with its valleys and wadi terraces extends from the dune zone to the first escarpment of the inland plateau. It is mainly formed of silty soils, locally moderately saline, sandier to the east, and generally cultivated either to cereals or to tree crops: fig-trees, olive, almond, grapes, date palm, etc. the width of the coastal plain varies from ca. 1 km to ca. 10 km. In the coastal plain also emerge a number (1 to 5, usually 3) ridges parallel to the shoreline made of soft oolithic Tyrrhenian (5000-15000 yrs old) sandstone/limestone, very much in demand as building material and heavily quarried between Borg et Arab and El Alamein. This Tyrrhenian oolithic calcareous sandstone bright white when fresh, turning to an ivory colour when exposed or weathered, is common along the southern shores of the south eastern Mediterranean from Cap Bon in Tunisia to S Turkey and everywhere popular as building material. The area covered by the coastal plain is of ca. 3750 km<sup>2</sup>.

The inland plateau is made of Mio-Pliocene outcrops of sandy limestone interspersed with sandstones, shales and occasionally unconsolidated interbedded sands (CONANT & GUDARZI, 1964). Some upper Miocene limestones may be fairly saline containing as they do 1-5% NaCl. This is quite unusual as the conditions of sedimentology of CaCO<sub>3</sub> and NaCl are normally not compatible. The salinity of these limestones is thus probably secondary, i.e. post-depositional. These saline limestones, wherever they outcrop directly, are generally covered with a halophytic steppe, often monospecific populations of *Suaeda pruinosa* and sometimes with *Limonium pruinosum* and/or *L. tubiflorum* as co-dominant companions. This is also a very unusual fact of typical perennial halophytic vegetation straight on well drained hard limestone geologic outcrops, with, of course, the exception of Triassic and other diapirs on which they are commonplace, but there are no diapirs in the region.

The inland plateau is generally covered with an upper and mid-Pleistocene calcrete 30-50 cm thick, very hard, salmon coloured with many *Helix* spp. inclusions, hence the often given name of «salmon crust of Helicidae» by the French speaking geologists and soil scientists. This calcrete is often quarried or bulldozed as a building material and/or for road construction.

One may distinguish three levels of the inland plateau raising respectively to ca. 50, 100 and ca. 200 m a.s.l., then softly declining southward (ca. 0.3% slope) to sea level or slightly below towards the oases of Siwa and Jarabub, and to -134 m at the bottom of the Qattara depression. The highest level is reached towards 50 km south of the shoreline. The inland plateau occupies an area of ca. 195 500 km<sup>2</sup>.

The Qattara depression extends to some 25 000 km<sup>2</sup> in the SE corner of the region north east of Siwa to the Fayoum depression from sea level down to -134 m, and -40 m in the Fayoum. The depression is covered with dry salt marshes and locally with halophytic vegetation (*Arthrocnemum*, *Atriplex*, *Chenolea*, *Halocnemum*, *Halopeplis*, *Imperata*, *Limonium*, *Limoniastrum*, *Nitraria*, *Phragmites*, *Salicornia*, *Sarcocornia*, *Salsola*, *Seidlitzia*, *Suaeda*, etc.).

The climate is arid Mediterranean on the north to 50 km from the shoreline (REGNER, 1997), hyper-arid Mediterranean from 50 to 100 km southwards and Eremaeo-Mediterranean (the scanty rain always occur in the winter season) further south. Details are shown in the ombrothermal diagrammes (LE HOUÉROU, 1989) and in the data and bioclimatic classification (FANTOLI, 1952; MAGGAZINI, 1963; FATHY & MEHANNA, 1980; LE HOUÉROU, 1984; AYYAD & VAN KREULEN, 1987; LE HOUÉROU, 1989; LE HOUÉROU, 1997b). The highest mean annual rainfall is slightly below 200 mm (Alexandria, Dekheila, Ras el Hekma, Ftaiah, Martuba) to the north dropping to 10 mm in Jarabub and Siwa.

## 2. The sources

The present catalogue results from the following information and data base:

1. Durand and Baratte's *Plantae Libycae Prodromus* (DURAND & BARATTE, 1910) contains a synoptic table with 303 taxa from the region called Turkish Marmarica (i.e. Libyan Marmarica).
2. The *Student's flora of Egypt* by Vivi Täckholm (TÄCKHOLM, 1974) includes 475 references to the flora of Marmarica, to which I added 155 taxa.
3. The *Flora of Egypt. Checklist* by L. Boulos (BOULOS, 1995) contains reference to 960 taxa from Marmarica, to which I added 30 taxa.
4. The *Flora of Libya* (ALI & JAFRI, 1976-1977; JAFRI & EL-GADI, 1977-1989).
5. The *Preliminary check list of the Libyan flora* by H. G. Keith (KEITH, 1965) and *Check list of the Libyan flora* by L. Boulos (BOULOS, 1977, 1979).

6. My book on the bioclimatology and biogeography of the arid steppeland north of the Sahara (LE HOUÉROU, 1995) lists 1178 species and subspecies of vascular plants in the Egyptian and Libyan steppes.
7. Data from the 146 scientific publications on the vegetation of NW Egypt, listed in the bibliography; many of these phytosociological surveys provide useful and detailed information on plant distribution in Egyptian Marmarica; all of them are not quoted in the text, tables and figures, they are nonetheless listed as a potential source of information and possible starting points for further investigations.
8. My own unpublished field data which include 250 site-surveys ("relevés" in the phytosociological jargon) in Egyptian Marmarica from 1988 to 1998 and 300 other relevés in Libyan Marmarica from 1964 to 1966 and from 1981 to 1983, which makes a total of 550 site plant-lists for overall Marmarica.
9. A third check list of the Libyan flora is not yet published.

### 3. General

The following catalogue identifies 1009 species present in Marmarica from Alexandria to Ras el Tin (40 km E of Derna), on a depth of 300 km from the Mediterranean shore inland. There are, in addition, some 6 subspecies, i.e. a total of 1015 epithets of vascular plants (there are only 2 species of ferns and 3 gymnosperms).

The close concurrence between BOULOS (1995) and LE HOUÉROU (1995), and both of them with the following catalogue ought to be underlined.

As suggested above, the following catalogue identifies 1015 taxa; of these, some:

- 534 taxa (53% of the flora) have virtually no grazing value.
- 476 (47% of the flora) are weeds of unknown utilization to me.
- 389 (38% of the flora) have a mediocre grazing value (scoring 1 to 3 on the evaluation scale).
- 96 (10% of the flora) constitute good grazing taxa (scoring 3 to 5 on the evaluation scale).
- 12 (1% of the flora) are excellent fodder taxa, i.e. actual or potential fodder crops, including some shrubs.
- 47 (5% of the flora) are toxic to stock (see § 4.2, 'grazing value').
- 98 (10% of the flora) are shrubs and trees (see § 4.2, 'biological type').
- 118 (12% of the flora) are halophytes.
- 177 (17% of the flora) are psammophytes.
- 104 (10% of the flora) are hygrophytes.
- 33 (3% of the flora) are hydrophytes.
- 56 (6% of the flora) are nitratophytes.
- 55 (5% of the flora) are chasmophytes.
- 18 (2% of the flora) are parasites or hemi-parasites.
- 138 (14% of the flora) have an actual or potential medicinal usage; for details on these medicinal usages (see BOULOS, 1983).

The systematic order, taxonomy and synonymy utilized follow BOULOS (1995) with few exceptions e.g. *Rhamnus lycioides* subsp. *oleoides* in Boulos is *R. oleoides* here, since, rightly or

wrongly, opposite to Boulos, I consider this taxon as quite a valid species on its own right. Some species have been added (e.g. *Helianthemum kahiricum* and *Periploca angustifolia*) and others removed (e.g. *Medicago sativa*) from the Boulos checklist. Some 12 species are recorded herein for the first time in Marmarica, e.g. *Acacia ehrenbergiana* «Seyal», recently reported by a bedouin from Wadi Iskanderia, ca. 150 km NE of Siwa (100 km E of Bir Nousf) (G. S. Mikhiel, *pers. comm.*). I should specify that I did not see this tree myself. I am only reporting information collected by someone else, which seemed plausible to me, from the description of the tree, of its fruit, and from the vernacular name given to it by nomads. This information requires confirmation, this is why I report it herein.

#### 4. Attributes Coding

##### 4.1 General

Table 3 shows the rating of the 92 parameters mentioned below, in addition to the scientific epithets and vernacular names. They are distributed in 12 groups in Table 3.

1. & 2. Scientific name (genus, species & subspecies).
3. Botanic family.
4. Local vernacular names are, to a large part, taken in TÄCKHOLM (1974), BOULOS (1983) and LE FLOC'H (1983), and from BOULOS & EL HADIDI (1984), with some additions and corrections from my own field experience, transliteration and transcription follow the mentioned sources.
5. Frequency status.
6. Area of distribution in 5 parallel belts from the Mediterranean shore to some 150 km inland, i.e. from a mean annual rainfall (MAR) belt of ca. 150 mm to less than 25 mm, then a sixth zone between 150 and 300 km from the shoreline, corresponding to the Eremaean zone or true desert with 25 to 10 mm of MAR.
7. Biological type.
8. Life span.
9. Habitat.
10. Utilization.
11. Grazing value on an evaluation scale.
12. Biological, ecological and other miscellaneous remarks.

##### 4.2 Codes

Below are presented explanations of codes of Table 3 for ‘frequency’, ‘area of distribution’, ‘biological type’, ‘life span’, ‘habitat’, ‘utilization’, ‘grazing value’ and ‘remarks’ respectively.

###### *Frequency status*

CC = Very common

C = Common

FC = Fairly common

FR = Fairly rare

R = Rare

RR = Very rare

This rating results from TÄCKHOLM (1974), from the many phytosociological studies published and mentioned in the bibliography and also from my own field notes.

*Area of distribution*

- I = 0-2 km from Mediterranean shoreline: ca. 750 km<sup>2</sup>
- II = 1-10 km inland steppe: ca. 3750 km<sup>2</sup>
- III = 10-25 km inland steppe: ca. 9375 km<sup>2</sup>
- IV = 25-50 km inland desert: ca. 18750 km<sup>2</sup>
- V = 50-150 km inland hyper-arid zone: ca. 75 000 km<sup>2</sup>
- VI = 150-300 km inland Eremaean zone: ca. 112 500 km<sup>2</sup> (including the Qattara depression: 25 000 km<sup>2</sup>)

The total area is ca. 220 125 km<sup>2</sup>.

*Biological type*

- C = Crassulescent (= fleshy halophyte)
- CH = Crassulescent (= fleshy herb)
- Cl = Climber
- F = Fern
- Fr = Frutescent (= herbaceous with a woody base)
- H = Herbaceous (forb & grass)
- Par = Parasite & hemi-parasite
- S = Shrub
- CS = Crassulescent shrub (= fleshy halophyte)
- DS = Dwarf shrub (h < 50 cm)
- HS = Tall shrub (h > 50 cm)
- TS = Trailing shrub
- Su = Succulent (= fleshy glycophyte)
- T = Tree (h > 3 m)

*Life span*

- A = Annual (= therophyte)
- B = Biennial
- P = Perennial
- Sh = Short-lived perennial (= pauciennial)

*Habitat*

- Bra = Brackish water
- Can = Canals
- cli = Cliffs
- Coa = Coastal (= littoral)
- Con = Continental
- Cul = Cultigene, rainfed crops and fallows
- Des = Desert (MAR < 100 mm)
- Dne = Dunes
- Frw = Fresh (sweet) water
- Irr = Irrigated land
- Rge = Rangeland
- Roc = Rocks
- Run = Runnels

Sea = Open sea water  
 Sha = Shallow soils  
 Snd = Sandy soils  
 Slt = Salt marshes  
 Ste = Steppe  
 Wad = Wadis & topographic depression  
 Wel = Wells  
 Wet = Wetland  
 Wld = Wasteland

*Utilization*

Cro = Crop  
 Fen = Fencing (live)  
 Fsh = Fodder shrub  
 Fue = Fuel wood  
 Gra = Grazing  
 Han = Handicraft  
 Med = Medicinal & herbal  
 Non = None  
 Orn = Ornamental  
 Sbi = Sand binding  
 Unk = Unknown  
 Veg = Vegetable, salad, fruit, human food  
 Wbr = Windbreak

*Grazing value*

T = Toxic  
 0 = No value  
 1 = Poor  
 2 = Mediocre  
 3 = Fair  
 4 = Good  
 5 = Excellent (fodder crops, incl. shrubs)

*Remarks*

Cha = Chasmophyte (craks, crevices, diaclases)  
 End = Endemic (restricted to Marmarica)  
 Ere = Eremophyte (= desert plant)  
 Fce = Fencing material  
 Fod = Fodder (actual or potential)  
 FoRe = Forest relict  
 Gly = Glycophyte (= non tolerant to salinity in generally halophytic groups)  
 Hal = Halophyte (salt - tolerant)  
 Hyd = Hydrophyte (living in free water)  
 Hyg = Hygrophyte (living in wet soils)  
 Nat = Naturalized xenophyte  
 Nit = Nitratophyte (on nitrates-rich soils)  
 Pel = Pelophyte (on clay soils)

- Phr = Phreatophyte (on water table)  
 Psa = Psammophyte (on sandy soils)  
 Sil = Limonophyte (on silty/loamy soils)  
 SO<sub>4</sub> = Gypsophyte (on gypsic soils)  
 Sum = Summer growing  
 Tac = Tachytherophytes (very short lived annuals: Aacheb – Ghizzu)  
 Wee = Weed (in range or crop)

#### **4.3 Interpretation of the Plant Biodiversity Table (Table 3)**

##### **4.3.1 Analysis of the flora**

Table 3 contains:

86 families of vascular plants, out of a total of 121 for the overall flora of Egypt (71%) and 168 (51%) for Libya.

451 genera out of an overall 742 (61%) for Egypt and 845 (53%) for Libya.

1015 species and subspecies which contain 777 dicots, 233 monocots, 3 gymnosperms and 2 ferns.

The overall vascular flora of Egypt includes 2121 taxa; the flora of Marmarica thus represents nearly half the Egyptian flora in terms of taxa numbers (47.9%). The flora of Libya includes 1930 taxa (2200 with the xenophytes); Marmarica as a whole thus represents the equivalent of some 53% of the country's flora. But this is not a realistic account since the flora of Libyan Marmarica does not exceed 400 taxa and thus the Libyan Marmarica flora is only 21% (= 400/1930) of the national vascular flora.

The largest families are as follows for both Marmarica and Egypt:

**Table 1. – Family Richness**

| Families         | Libya<br>Nr of spp. | %           | Marmarica<br>Nr of spp. | %           | Egypt<br>Nr of spp. | %           |
|------------------|---------------------|-------------|-------------------------|-------------|---------------------|-------------|
| Compositae       | 277                 | 14.4        | 128                     | 12.6        | 230                 | 10.8        |
| Gramineae        | 238                 | 12.3        | 130                     | 12.8        | 277                 | 13.1        |
| Leguminosae      | 210                 | 10.9        | 104                     | 10.2        | 233                 | 11.0        |
| Cruciferae       | 116                 | 6.0         | 62                      | 6.1         | 102                 | 4.8         |
| Chenopodiaceae   | 64                  | 3.3         | 51                      | 5.0         | 77                  | 3.6         |
| Boraginaceae     | 53                  | 2.7         | 32                      | 3.2         | 55                  | 2.6         |
| Caryophyllaceae  | 66                  | 3.4         | 41                      | 4.0         | 85                  | 4.0         |
| Umbelliferae     | 85                  | 4.4         | 30                      | 3.0         | 51                  | 2.4         |
| Cyperaceae       | 28                  | 1.5         | 25                      | 2.5         | 44                  | 2.1         |
| Convolvulaceae   | 18                  | 0.9         | 22                      | 2.2         | 48                  | 2.3         |
| Labiatae         | 64                  | 3.3         | 16                      | 1.6         | 55                  | 2.6         |
| Scrophulariaceae | 38                  | 2.0         | 13                      | 1.3         | 62                  | 2.9         |
| <b>Total</b>     | <b>1257</b>         | <b>65.1</b> | <b>654</b>              | <b>64.4</b> | <b>1319</b>         | <b>62.2</b> |

The 27 larger genera in taxa numbers are shown in Table 2.

**Table 2. – Number of taxa in the major genera**

| Genera              | Nr of spp. |           |       |
|---------------------|------------|-----------|-------|
|                     | Libya      | Marmarica | Egypt |
| <i>Euphorbia</i>    | 19         | 19        | 42    |
| <i>Medicago</i>     | 21         | 16        | 18    |
| <i>Plantago</i>     | 15         | 14        | 18    |
| <i>Allium</i>       | 9          | 13        | 22    |
| <i>Silene</i>       | 19         | 13        | 24    |
| <i>Trifolium</i>    | 22         | 13        | 19    |
| <i>Erodium</i>      | 16         | 12        | 14    |
| <i>Convolvulus</i>  | 16         | 12        | 23    |
| <i>Astragalus</i>   | 29         | 11        | 32    |
| <i>Atriplex</i>     | 14         | 11        | 15    |
| <i>Centaurea</i>    | 8          | 10        | 16    |
| <i>Cyperus</i>      | 6          | 10        | 23    |
| <i>Helianthemum</i> | 19         | 10        | 23    |
| <i>Lotus</i>        | 17         | 10        | 12    |
| <i>Salsola</i>      | 12         | 10        | 20    |
| <i>Reseda</i>       | 7          | 9         | 14    |
| <i>Trigonella</i>   | 8          | 9         | 11    |
| <i>Amaranthus</i>   | 4          | 8         | 11    |
| <i>Bromus</i>       | 9          | 8         | 11    |
| <i>Fumaria</i>      | 8          | 8         | 16    |
| <i>Persicaria</i>   | 1          | 8         | 8     |
| <i>Bellevalia</i>   | 1          | 7         | 8     |
| <i>Echium</i>       | 13         | 7         | 12    |
| <i>Limonium</i>     | 13         | 7         | 7     |
| <i>Scirpus</i>      | 1          | 7         | 7     |
| <i>Suaeda</i>       | 7          | 7         | 9     |
| <i>Vicia</i>        | 11         | 7         | 9     |
| Total n             | 325        | 276       | 444   |
| % of flora          | 17         | 27        | 21    |

The above tables shows that the flora of Marmarica is, by and large, similar to that of the two countries as a whole in its proportions.

It is worth noting that genera having many taxa of hygrophytes or of halophytes are particularly well represented in Egyptian Marmarica:

| Hygrophytes       | Halophytes      |
|-------------------|-----------------|
| <i>Cyperus</i>    | <i>Atriplex</i> |
| <i>Persicaria</i> | <i>Limonium</i> |
| <i>Scirpus</i>    | <i>Salsola</i>  |
| <i>Trigonella</i> | <i>Suaeda</i>   |

The same remark applies to genera with many weeds, nitratophytes and wasteland taxa:

| Hygrophytes       | Halophytes       |
|-------------------|------------------|
| <i>Allium</i>     | <i>Euphorbia</i> |
| <i>Amaranthus</i> | <i>Fumaria</i>   |
| <i>Bellevalia</i> | <i>Medicago</i>  |
| <i>Bromus</i>     | <i>Reseda</i>    |
| <i>Centaurea</i>  | <i>Silene</i>    |
| <i>Echium</i>     |                  |

In terms of endemics, BOULOS (1995) recognizes 61 endemic taxa in Egypt of which over half are from Sinaï. Marmarica is poorer in this respect since we only record 19 species and subspecies:

|   |  |
|---|--|
| <i>Allium blomfeldianum</i> <b>E</b>            | <i>Lepidium aucheri</i> <b>E &amp; L</b>                         |
| <i>Allium desertorum</i> <b>E &amp; L</b>       | <i>Nigella arvensis</i> subsp. <i>taubertii</i> <b>E &amp; L</b> |
| <i>Allium mareoticum</i> <b>E &amp; L</b>       | <i>Pancratium arabicum</i> <b>E &amp; L</b>                      |
| <i>Allium myrianthum</i> <b>E</b>               | <i>Silene fruticosa</i> <b>E &amp; L</b>                         |
| <i>Carduncellus mareoticus</i> <b>E &amp; L</b> | <i>Silene biappendiculata</i> <b>L</b>                           |
| <i>Echinops taeckholmianus</i> <b>E</b>         | <i>Teucrium brevifolium</i> <b>E &amp; L</b>                     |
| <i>Ebenus armitagei</i> <b>E &amp; L</b>        | <i>Verbascum letourneuxii</i> <b>E &amp; L</b>                   |
| <i>Ferula marmarica</i> <b>E &amp; L</b>        | <i>Viola scorpiuroides</i> <b>E &amp; L</b>                      |
| <i>Helianthemum sphaerocalyx</i> <b>E</b>       | <i>Zilla spinosa</i> subsp. <i>biparmata</i> <b>E &amp; L</b>    |
| <i>Herniaria cyrenaica</i> <b>L</b>             |  |

**E** = Egyptian endemics; **L** = Libyan endemics.

As one can see most endemics are shared between the two sub-regions.

Microendemism (varieties are not considered in Table 3) is represented by the following:

- *Centaurea conglomerata* var. *claviceps*, *Pituranthus tortuosus* var. *virgatus* (= var. *arcuatus* Le Houérou).
- *Vicia calcarata* var. *marmarica*.

#### 4.3.2 Floristic similarities and differences between Libyan and Egyptian Marmarica

There are some 24 taxa from the Libyan side of Marmarica that have not been reported from the Egyptian part:

*Juniperus phoenicea*, *Paretaria lusitanica*, *Blitum virgatum*, *Atriplex mollis*, *Diplotaxis simplex*, *Sinapis pubescens*, *Euphorbia bivonae*, *Olea europaea* subsp. *oleaster*, *Phyllirea media*, *Pergularia tomentosa*, *Calotropis procera*, *Convolvulus supinus*, *C. tricolor*, *Cuscuta europaea*, *C. epithymum*, *Scaligeria cretica*, *Borago officinalis*, *Ballota pseudo-dictamnus*, *Rhanterium suaveolens*, *Asparagus stipularis*, *Castellia tuberculata*, *Melica minuta*, *Elytrigia cristata*, *E. juncea*.

These include a number of taxa linked to the Libyan semi-arid vegetation of Cyrenaica which extends into nearby eastern Marmarica, for reason of vicinity. Conversely there are some 625 taxa present in Egyptian Marmarica which are lacking on the Libyan side of the political border.

These are mostly hydrophytes, hygrophytes, helophytes and wetland taxa tied to canals, ponds, irrigation and agriculture such as, but not limited to, the following 21 genera and 68 species:

*Persicaria*, 8 species, *Ranunculus*, 4 species, *Lythrum*, 3 species, *Ammania*, 4 species, *Centaurium*, 3 species, *Damasonium*, 1 species, *Najas*, 3 species, *Potamogeton*, 4 species, *Ruppia*, 2 species, *Juncus*, 6 species, *Leersia*, 1 species, *Spirodela*, 1 species, *Lemna*, 1 species, *Pseudowolfia*, 1 species, *Typha*, 1 species, *Carex*, 2 species, *Schoenus*, 1 species, *Fimbristylis*, 2 species, *Scirpus*, 7 species, *Eleocharis*, 3 species, *Cyperus*, 10 species.

#### 4.3.3 Frequency status (see § 4.2 for abbreviations)

| Frequency status | Nr of spp.  | Subtotal    | %          | Subtotal   |
|------------------|-------------|-------------|------------|------------|
| CC               | 204         | 489         | 20.1       | 48.2       |
| C                | 168         |             | 16.6       |            |
| FC               | 117         |             | 11.5       |            |
| FR               | 81          | 525         | 8.0        | 51.8       |
| R                | 269         |             | 26.5       |            |
| RR               | 175         |             | 17.3       |            |
| <b>Total</b>     | <b>1014</b> | <b>1014</b> | <b>100</b> | <b>100</b> |

The above table shows that rare taxa are slightly more numerous than the common ones, a fact that could be interpreted as one more evidence of the intensive anthropization of the Marmarica vegetation and flora.

#### 4.3.4 Area of distribution (see § 4.2 for abbreviations)

| Area of distribution | Nr of spp.  | %          |  |
|----------------------|-------------|------------|--|
| I                    | 33          | 3.3        | Shoreline                              |
| I-II                 | 683         | 67.3       | Shore and coastal plain steppe         |
| I-III                | 186         | 18.3       | Shore and steppe                       |
| I-IV                 | 22          | 2.2        | Shore, steppe and desert               |
| I-VI                 | 10          | 1.0        | Shore, steppe, desert and Eremian zone |
| II-III               | 10          | 1.0        | Steppe                                 |
| II-IV                | 21          | 2.1        | Steppe and desert                      |
| II-VI                | 4           | 0.4        | Steppe, desert & Eremian               |
| III-IV               | 9           | 0.9        | Desert and Eremian                     |
| III-VI               | 37          | 3.6        | Desert and Eremian                     |
| <b>Total</b>         | <b>1015</b> | <b>100</b> |  |

The above table shows that the shore and steppe zones include some 90% of the taxa while less than 10% are restricted to the desert. The shore and steppe zones include the newly irrigated land west of the Nile Delta (El Amariya, El Nobariya, El Hammam, Borg el Arab, etc.) which significantly contributes to this richness.

This zone includes some 148 taxa tied to irrigation and wetlands and free water areas (canals, ponds).

#### 4.3.5 Biotypes (see § 4.2 for abbreviations)

| Biological types | Nr of spp. | %    |
|------------------|------------|------|
| CH               | 26         | 2.5  |
| Cl               | 11         | 1.1  |
| F                | 2          | 0.2  |
| Fr               | 50         | 4.8  |
| H                | 816        | 79.0 |
| Par              | 18         | 1.7  |
| S                | 3          | 0.3  |
| CS               | 25         | 2.4  |
| DS               | 20         | 1.9  |
| HS               | 37         | 3.6  |
| TS               | 10         | 1.0  |
| Su               | 6          | 0.6  |
| T                | 9          | 0.9  |
| <b>Total</b>     | 1033       | 100  |

The total number of taxa is superior to 1015, the codes being not mutually exclusive.

Biotypes are largely dominated by herbaceous taxa (CH, F and H = 82% of the flora), i.e. 844 taxa. Woody or partially woody taxa (T, S and Fr) represent only 6% of the flora, i.e. 62 taxa. The number of succulent taxa (fleshy glycophytes) is negligible (6). The same remark applies to climbers (11). Crassulescent shrubs (CS) and crassulescent herbs (CH) are halophytes; they number 51; half of them are *Chenopodiaceae*.

#### 4.3.6 Life span (see § 4.2 for abbreviations)

| Life span    | Nr of spp. | %    |
|--------------|------------|------|
| A            | 575        | 54.9 |
| B            | 27         | 2.6  |
| P            | 433        | 41.3 |
| Sh           | 13         | 1.2  |
| <b>Total</b> | 1048       | 100  |

The total number of taxa is superior to 1015, the codes being not mutually exclusive.

Annual taxa constitute 55% of the flora; most are herbaceous. Biennials and short lived perennials (pauciennials) represent an insignificant proportion (4%).

*4.3.7 Habitat (see § 4.2 for abbreviations)*

| Habitat      | Nr of spp.  | %          |
|--------------|-------------|------------|
| Bra          | 3           | 0.2        |
| Can          | 24          | 1.3        |
| Cli          | 38          | 2.1        |
| Coa          | 31          | 1.7        |
| Con          | 4           | 0.2        |
| Cul          | 453         | 25.5       |
| Des          | 36          | 2.0        |
| Dne          | 12          | 0.7        |
| Frw          | 24          | 1.3        |
| Irr          | 32          | 1.8        |
| Rge          | 288         | 16.2       |
| Roc          | 32          | 1.8        |
| Run          | 24          | 1.4        |
| Sea          | 5           | 0.3        |
| Sha          | 33          | 1.9        |
| Snd          | 75          | 4.2        |
| Slt          | 64          | 3.6        |
| Ste          | 145         | 8.2        |
| Wad          | 47          | 2.6        |
| Wel          | 4           | 0.2        |
| Wet          | 96          | 5.4        |
| Wld          | 308         | 17.3       |
| <b>Total</b> | <b>1778</b> | <b>100</b> |

The total number of taxa is superior to 1015, the codes being not mutually exclusive.

The above table shows that the area under study is a very disturbed one, subjected to heavy anthropogenic pressure, since the field and fallow taxa (Cul) represent 26% of the flora while those from wastelands (Wld and Wet) are 404 i.e. another 23%. The total of taxa from disturbed land thus represents 49% of the flora. This is further confirmed by the analysis of the features related to ecology and utilization as shown below. The taxa related to water and wet soils (Bra, Can, Frw, Irr & Wet) are 179, i.e. 10% of the flora.

#### 4.3.8 Utilization (see § 4.2 for abbreviations)

| Features     | Nr of spp.  | %          |
|--------------|-------------|------------|
| Cro          | 6           | 0.5        |
| Fen          | 6           | 0.5        |
| Fsh          | 10          | 0.9        |
| Fue          | 31          | 2.7        |
| Gra          | 410         | 36.3       |
| Han          | 8           | 0.7        |
| Med          | 138         | 12.2       |
| Non          | 473         | 41.8       |
| Orn          | 18          | 1.6        |
| Sbi          | 5           | 0.4        |
| Unk          | 5           | 0.4        |
| Veg          | 17          | 1.5        |
| Wbr          | 4           | 0.4        |
| <b>Total</b> | <b>1131</b> | <b>100</b> |

The total number of taxa is superior to 1015, the codes being not mutually exclusive.

A total of 478 taxa (42% of the flora) have no use or an unknown utilization; this confirms the data from subsection 4.3.7 on habitat; a substantial number of taxa, however, is utilized for grazing (410, i.e. 36% of the flora). A third trait has a significant number: the medicinal and herbal taxa (138, i.e. 12% of the flora).

#### 4.3.9 Grazing value (see § 4.2 for abbreviations)

| Parameter    | Nr of spp.  | Subtotal | %          | Subtotal   |
|--------------|-------------|----------|------------|------------|
| T            | 47          | 581      | 4.6        | 57.3       |
| 0            | 534         |          | 52.7       |            |
| 0-1          | 2           | 337      | 0.2        | 33.2       |
| 1            | 126         |          | 12.4       |            |
| 1-2          | 44          |          | 4.3        |            |
| 2            | 132         |          | 13.0       |            |
| 2-3          | 33          |          | 3.3        |            |
| 3            | 54          | 96       | 5.3        | 9.5        |
| 3-4          | 13          |          | 1.3        |            |
| 4            | 13          |          | 1.3        |            |
| 4-5          | 4           |          | 0.4        |            |
| 5            | 12          |          | 1.2        |            |
| <b>Total</b> | <b>1014</b> |          | <b>100</b> | <b>100</b> |

The above table shows that 96 taxa in the flora (9.5%) have a fair to good grazing value. Unfortunately most of those have become rare and none of them is dominant. It shows, however, that the flora has still, in principle, a good potential for range regeneration, if the land

were appropriately managed. The depletion is not yet beyond repair. The number of taxa with a low grazing value is 337 (33%) while those of no grazing value or toxic (poisonous) to stock are 581 (57%); this confirms, once more, the previous diagnosis: heavy anthropozoic pressure on disturbed and depleted land and vegetation.

*4.3.10 Remarks and edaphic biological and ecological classification (see § 4.2 for abbreviations)*

| Traits          | Nr of spp.  | %          |
|-----------------|-------------|------------|
| Cha             | 55          | 4.4        |
| End             | 18          | 1.4        |
| Ere             | 42          | 3.4        |
| Fod             | 14          | 1.1        |
| Gly             | 13          | 1.0        |
| Hal             | 118         | 9.5        |
| Hyd             | 33          | 2.6        |
| Hyg             | 104         | 8.3        |
| Nat             | 10          | 0.8        |
| Nit             | 56          | 4.5        |
| Pel             | 24          | 1.9        |
| Phr             | 16          | 1.3        |
| Psa             | 177         | 14.2       |
| Sil             | 46          | 3.7        |
| S0 <sub>4</sub> | 23          | 1.8        |
| Sum             | 21          | 1.7        |
| Tac             | 39          | 3.1        |
| Wee             | 439         | 35.2       |
| <b>Total</b>    | <b>1248</b> | <b>100</b> |

The total number of taxa is superior to 1015, the codes being not mutually exclusive.

Again, the taxa from disturbed land are in large numbers (Wee + Nit = 495 i.e. 40% of the flora).

Psammophytes are in sizeable numbers (14% of the flora) and often make up the best grazing; hygrophytes and hydrophytes make up 11% of the flora and halophytes 10%.

Chasmophytes are not in large numbers but they have an important role as cliffs and rocks constitute a refuge where species that have become rare can find shelter and relative protection due to a relative site inaccessibility to man and stock. Many cliffs, runnels and wadis constitute sites of high biodiversity, where 50 to 100 ± rare species can be found over an area of 1000 m<sup>2</sup>. Among those one may include:

*Allium mareoticum*  
*Anabasis oropediorum*  
*Artemisia herba-alba*  
*Capparis rupestris*  
*Convolvulus oleifolius*  
*Dactylis hispanica*  
*Dichanthium annulatum*  
*Echiochilon fruticosum*  
*Euphorbia dendroides*  
*Euphorbia bivonae*  
*Euphorbia hierosolymitana*  
*Fagonia cretica*  
*Globularia arabica*  
*Helianthemum sessiliflorum*  
*Helianthemum sphaerocalyx*  
*Hyparrhenia hirta*  
*Lotus creticus*

*Micromeria nervosa*  
*Moricandia nitens*  
*Oryzopsis miliacea*  
*Periploca angustifolia*  
*Phagnalon rupestre*  
*Phlomis fruticosa*  
*Polygonum equisetiforme*  
*Prasium majus*  
*Rhamnus oleoides*  
*Rhus tripartita*  
*Silene fruticosa*  
*Silene vulgaris*  
*Thymus capitatus*  
*Varthemia candicans*  
*Verbascum letourneuxii*  
*Ziziphus lotus*

As mentioned above the large number of hydrophytes and hygrophytes reflects the presence in the eastern part of Marmarica of large irrigated zones, west of Alexandria.

Biodiversity has been herein evaluated on a 6 degrees scale according to the number of species recorded, in spring-time, over a standard sampling area of 2500 m<sup>2</sup> (1/4 hectare or 0.6 feddan):

|                                 |                       |
|---------------------------------|-----------------------|
| 1: 0-10 - Depleted / Desertized | 4: 40-60 - Medium     |
| 2: 10-20 - Poor / Low           | 5: 60-80 - Good       |
| 3: 20-40 - Fair                 | 6: > 80 - Outstanding |

## 5. Conclusions

Marmarica is a botanically rich province, considering its climatic aridity, since it harbours almost 50% of the Egyptian flora and 21% of the Libyan flora, similar in that to Sinaï (same size: 960 taxa). The 1015 Marmarican taxa represent the equivalent of 37% of the Saharan flora on only 2.6% of the surface area. Sinaï, however, due to its high mountains, has a higher rate of biodiversity, with 31 endemic taxa vs 18 for Marmarica. The same rationale applies to the comparison between Libyan, Marmarica and Cyrenaïca. The latter, due to its semi-arid and locally sub-humid bioclimate, its forest vegetation and its geographic isolation is an «island of endemism» with some 100 endemic taxa and many micro-endemics, for an overall flora of ca. 900 taxa, i.e. 11% vs less than 3% for Egypt, ca. 1.8% for Marmarica as a whole, 4% for the Libyan part and 1.8% for the Egyptian part.

The Marmarica flora belongs to the Ibero-Maghribian sub-province of the Mediterraneo-steppic province within the Mediterranean phytogeographic region; some Irano-Turanian and Saharo-Arabian elements are also present due to the vicinity of these two phytogeographic entities but they represent less than 10% of the flora each, while the tropical element is almost absent. But Egyptian Marmarica, likewise the Nile valley and delta, harbours a large number of cosmopolitan and pluriregional taxa tied to irrigation. Conversely Libyan Marmarica where irrigation is scant does not possess this cosmopolitan flora. These facts were carefully analysed in detail in my opus of 1995 on the bioclimatology and phytogeography of the arid steppes N of the Sahara and its more recent synthesis in English language (LE HOUÉROU, 2001).

An important characteristic of the Marmarica flora and vegetation is their high degree of anthropization. Most pristine steppes (e.g. of *Artemisia herba alba*) are reduced to a few scattered plots of a few feddans (1 feddan = 1 acre = 4200 m<sup>2</sup>). The only one of any size I could find had about 20 ha at ca. 12 km E of Sidi Barrani along the highway to Marsa-Matruh, it was only made possible by the initiative of a «conservative» settled farmer. According to the FAO (1970) range map «Shih» steppes still covered some 220000 hectares W of El Alamein in the late 1960's mostly between El Alamein and Fuka (187500 ha) with two nuclei S and E of Sidi Barrani (12500 ha) and SW of Negheila (22500 ha) (FAO, 1970; VAN DER VEEN & al., 1968).

Species that are sought for by man and livestock find (temporary?) refuge in cliffs, runnels, wadi cañons and rocks. If some action is to be taken for the restoration of biodiversity it should be a total protection (closure) of these refuges.

Many other conclusions could be drawn from Table 3 through the systematic study of correlations between a number of parameters such habitat and utilization, grazing value versus families and genera, etc. I leave this studies to the potential users of the present work. I have proposed a concrete programme of conservation to protect the relict species, as a potential source of drought-tolerant and potentially economic germplasm material for arid-land revegetation (LE HOUÉROU, 1998e). As feared, nothing happened after four years, in spite of the fact that the resources were available, from a IBRD loan, to carry out such a programme.

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#### REFERENCES

- The present bibliography is meant to cover the various aspects of vegetation and rangeland sciences in Egyptian and Libyan Marmarica. It includes some 170 references; it is believed to be fairly exhaustive, covering both formal and informal scientific publications, including the so-called «grey literature». Not all of them are mentioned in the text, tables or figures.
- ABDEL-KADER, F. (1980). *Soil erosion*. REMDENE n° 1, 4: 4/1-4/27. University of Alexandria.
- ABDEL-KADER, F. (1981). *Semi-detailed soil survey, El Omayed pilot area*. REMDENE n° 2, 3(3): 8-33. University of Alexandria.
- ABDEL-RAHMAN, A. A., M. A. AYYAD & M. M. EL-MONAYARI (1966). Hydroecology of the sand dune habitat at Burg-el-Arab. *Bull. Fac. Sci. Cairo Univ.* 40: 29-54.
- ADEL-RAHMAN, A. A. & M. A. HAMMOUDA (1960). Vegetation development in fenced areas at Ras-el-Hekma in four years. *U.A.R. J. Bot.* 3: 1-11.
- ABDEL-RAZIK, M. (1976). *A study on the vegetation composition, productivity and phenology in a Mediterranean desert ecosystem at Omayed (Egypt)*. MSc thesis. University of Alexandria. 106 p.
- ABDEL-RAZIK, M., M. ABDEL-AZIZ & M. A. AYYAD (1984). Multivariate analysis of vegetational variation in different habitats of Omayed (Egypt). *Vegetatio* 57: 167-175.
- ABDEL-RAZIK, M., M. A. AYYAD & S. HENEIDY (1988a). Phytomass and mineral composition in range biomass of a Mediterranean arid ecosystem (Egypt). *Acta Oecol., Oecol. Pl.* 9: 359-370.
- ABDEL-RAZIK, M., M. A. AYYAD & S. HENEIDY (1988b). Preference of grazing mammals for forage species and their nutritive value in a Mediterranean desert ecosystem (Egypt). *J. Arid Environm.* 15: 297-305.
- AHMED, A. M. & M. M. MOUNIR (1982). *Regional studies on the natural resources of the NW coastal zone, Egypt*. US National Science Foundation. Oklahoma State University and the UNEP Remote Sensing Centre. Academy of Scientific Research and Technology, Cairo. 195 p.
- ALI, S. I. & S. M. H. JAFRI (eds.) (1976-1977). *Flora of Libya*. Al Faateh University, Tripoli.

- ASLAN, M. H. (1959). *Adaptability and palatability of some forage plants in the western desert of Egypt*. MSc thesis. University of Cairo.
- ATTA, B. A. M. (1953). *Ecological and sociological studies on the plant communities of Mariut*. MSc thesis. University of Alexandria. 130 p.
- AYYAD, M. A. (1957). *An ecological study of Ras el Hikma*. MSc thesis. University of Cairo. 281 p.
- AYYAD, M. A. (1971a). An edaphic study of habitats at Ras-el-Hekma. *Desert Inst. Bull.* 19: 245-259.
- AYYAD, M. A. (1971b). A study of solar radiation on sloping surfaces at Alexandria. *U.A.R. J. Bot.* 14: 15: 65-73.
- AYYAD, M. A. (1973). Vegetation and environment of the western Mediterranean coastal land of Egypt. I The habitat of sand dunes. *J. Ecol.* 61: 509-523.
- AYYAD, M. A. (1976). Vegetation and environment of the western Mediterranean coastal land of Egypt. IV The habitat of non-saline depressions. *J. Ecol.* 64: 713-722.
- AYYAD, M. A. (1978). A preliminary assessment of the effect of protection on the vegetation of the Mediterranean desert ecosystem. *Taeckholmia* 9: 85-101.
- AYYAD, M. A. (1979). *Phytomass, phenology and necromass*. SAMDENE n° 5, 1: 1/1-1/60. University of Alexandria.
- AYYAD, M. A. (1981). Soil-vegetation-atmosphere interactions. In: GOODALL, D. W. & R. M. PERRY (eds.), *Arid Land Ecosystems: Structure, Functioning and Management* 2: 9-31. Cambridge University Press.
- AYYAD, M. A. (1983a). Some aspects of land transformation in the western Mediterranean desert of Egypt. *Advances Space Res.* 2(8): 19-29.
- AYYAD, M. A., M. ABDEL-RAZIK & S. EL-DARIER (1985). Variations in nutrient contents in olive agroecosystems in the western desert of Egypt. *Proc. Egypt. Bot. Soc.* 4: 1277-1297.
- AYYAD, M. A., M. ABDEL-RAZIK & N. GHALI (1983). On the phenology of desert species of western Mediterranean coastal region of Egypt. *Int. J. Ecol. Environm. Sci.* 9: 169-183.
- AYYAD, M. A. & M. Y. AMMAR (1973). Relationship between local physiographic variations and the distribution of common Mediterranean desert species. *Vegetatio* 27: 163-176.
- AYYAD, M. A. & M. Y. AMMAR (1974). Vegetation and environment of the western Mediterranean coastal land of Egypt. II The habitat of inland ridges. *J. Ecol.* 62: 439-456.
- AYYAD, M. A. & M. A. EL BAYYOUMI (1979). On the phytosociology of sand dunes of the western desert of Egypt. In: SINGH, J. S. & B. GOPAL (eds.), *Glimpses of Ecology*: 219-237. International Scientific Publications, Jaipur.
- AYYAD, M. A. & R. M. EL-GHAREEB (1972). Microvariations in edaphic factors and species distribution in a Mediterranean salt desert. *Oikos* 23: 125-131.
- AYYAD, M. A. & R. M. EL-GHAREEB (1973). Correlation of the distribution of common halophilous species at Burg-el-Arab (Egypt) with salinity and level of the water table. *Egypt. J. Bot.* 16: 379-386.
- AYYAD, M. A. & R. M. EL-GHAREEB (1982). Salt marshes vegetation of the western Mediterranean desert of Egypt. *Vegetatio* 49: 3-19.
- AYYAD, M. A. & A. A. EL-GHONEIMY (1976). Phytosociological and environmental gradients in a sector of the western desert of Egypt. *Vegetatio* 31: 93-102.
- AYYAD, M. A. & H. F. EL-KADI (1981). *Consumption and behaviour of grazing animals*. REMDENE n° 2, 1: 2/1-2/31. University of Alexandria.
- AYYAD, M. A. & H. F. EL-KADI (1982). Effect of protection and controlled grazing on the vegetation of a Mediterranean desert ecosystem in northern Egypt. *Vegetatio* 49: 129-139.
- AYYAD, M. A. & S. I. GHABBOUR (1977). Systems analysis of Mediterranean desert ecosystems of northern Egypt. *Environm. Conservation* 4: 91-101.
- AYYAD, M. A. & S. H. HILMY (1974). The distribution of *Asphodelus microcarpus* and associated species on the western Mediterranean coast of Egypt. *Ecology* 55: 511-524.
- AYYAD, M. A. & S. KAMAL (1980). *Analysis of vegetation*. REMDENE n° 1, 1: 3/1-3/30. University of Alexandria.
- AYYAD, M. A. & S. KAMAL (1988). Ground surveys and remote sensing of vegetation and land-use in Mariut (Egypt). In: EL-RAEY, M. (ed.), *Symposium of Environmental Sciences*: 134-154. University of Alexandria.
- AYYAD, M. A. & E. LE FLOCH (eds) (1983). *An ecological assessment of renewable resources for agricultural development in western Mediterranean coastal region of Egypt*. CNRS, ORSTOM, REMDENE. Montpellier, Paris, Alexandria. 104 p.

- AYYAD, M.A., K. H. SHALTOUT, N. N. GHALY, H. F. EL-KADI & S. A. OMAR (1979). *Phytomass, phenology and necromass*. SAMDENE n° 5, 1: 1/1-1/8. University of Alexandria.
- AYYAD, M. A. & H. VAN KEULEN (eds) (1987). *The 'Mariut' project. Final report submitted to Directorate General for International Cooperation (DGIS)*, part 2: 61-92, part 3. CABO-report, Wageningen. 150 p.
- BATANOUNY, K. H. (1968). On the autoecology of *Pithyranthus tortuosus* (Desf.) Benth. & Hook. *Bull. Fac. Sci. Cairo Univ.* 42: 35-45.
- BATANOUNY, K. H. & S. ABU EL-SOUOD (1972). Ecological and phytosociological study of a sector in the Libyan desert. *Vegetatio* 25: 335-356.
- BATANOUNY, K. H. & M. A. F. ZAKI (1969). Root development of two common species in different habitats in the Mediterranean subregion in Egypt. *Acta Bot. Acad. Sci. Hung.* 15: 217-226.
- BATANOUNY, K. H. & M. A. F. ZAKI (1973). Range potentialities of a sector in the Mediterranean coastal region in Egypt. *Vegetatio* 27: 115-130.
- BOULOS, L. (1977). A check list of the Libyan flora. 1: Introduction and Adianthaceae-Orchidaceae. *Publ. Cairo Univ. Herb.* 7-8: 115-141.
- BOULOS, L. (1979). A check list of the Libyan flora. 2: Salicaceae-Neuradaceae. *Candollea* 34: 21-48.
- BOULOS, L. (1983). *Medicinal Plants of North Africa*. Référence Publications, Inc.
- BOULOS, L. (1995). *Flora of Egypt. Checklist*. Al Hadara Publishing.
- BOULOS, L. (1999). *Flora of Egypt* 1. Al Hadara Publishing.
- BOULOS, L. (2000). *Flora of Egypt* 2. Al Hadara Publishing.
- BOULOS, L. & M. EL HADIDI (1984). *The Weed Flora of Egypt*. American University in Cairo Press.
- BOULOS, L. & C. JEFFREY (1979). A check list of the Libyan flora. 3: Compositae. *Candollea*: 34: 307-332
- CONANT, L. C. & G. H. GOUDARZI (1964). *Geologic map of the Kingdom of Libya*. Map I – 350 A, Scale 1: 2,000,000. Miscellaneous Geologic Investigations US Geological Survey, Department of the Interior.
- DRAZ, O. (1954). Some desert plants and their uses in animal feeding (*Kochia indica* and *Prosopis juliflora*). *Publ. Inst. Désert Egypte* 2.
- DURAND, E. & G. BARRATTE (1910). *Florae Libycae Prodromus*. Genève.
- EL-BAYYOUMY, M. A. (1976). *Ecological Phytosociological studies on the sand dune vegetation at Mariut area*. MSc thesis. University of Tanta. 70 p.
- EL-GHAREEB, R. M. (1975). *A study of the vegetation-environmental complex of saline and marshy habitats on the North Western coast of Egypt*. PhD thesis. University of Alexandria. 203 p.
- EL-GHAREEB, R. M. & K. SHALTOUT (1978). *Standing Crop biomass*. SAMDENE n° 4, 1: 4/1-4/74. University of Alexandria.
- EL-GHONEMY, A. A. (1973). Phytosociological and Ecological studies of the maritime sand dunes communities in Egypt. I Zonation of vegetation and soil along a dune side. *Bull. Inst. Désert Egypte* 23(2): 463-473.
- EL-GHONEMY, A. A. & A. S. EL-DIN (1978). *Root systems of perennials*. SAMDENE n° 4, 1: 8/1-8/18. University of Alexandria.
- EL-GHONEMY, A. A. & E. M. GEWAIFEL (1976). The phytosociological groups and their habitats at Sidi Barrani. *Egypt. J. Bot.* 19: 77-87.
- EL-GHONEMY, A. A. & H. F. EL-KADI (1978). *Range Management*. SAMDENE n° 4, 1: 10/1-10/20. University of Alexandria.
- EL-GHONEMY, A. A., K. SHALTOUT, W. VALENTINE & A. WALLACE (1977). Distribution pattern of *Thymelaea hirsuta* (L.) Endl. and associated species along the Mediterranean coast of Egypt. *Bot. Gaz.* 138: 479-489.
- EL-GHONEMY, A. A. & T. M. TADROS (1970). Socio-ecological studies of the natural plant communities along a transect between Alexandria and Cairo. *Bull. Fac. Sci. Cairo Univ.* 10: 329-407.
- EL-HADIDI, M. N. & M. A. AYYAD (1974). Floristic and ecological features of Wadi Habis (Egypt). In: GUINOCHE, M., G. GUITTONNEAU, P. OZENDA, P. QUEZEL & C. SAUVAGE (eds.), *La Flore du Bassin Méditerranéen: essai de systématique synthétique*: 247-258. Editions du CNRS.
- EL-KADY, H. F. (1980). *Effect of grazing pressure on certain ecological parameters of some fodder plants of the Mediterranean coast of Egypt*. MSc thesis. University of Tanta. 95 p.
- EL-KADY, H. F. (1987). *A study of range ecosystems of the western Mediterranean coastal desert of Egypt*. PhD thesis. Technical University of Berlin.

- EL-NAGA, M. A. (1980). *Nutritive value of the plants at Omayed*. REMDENE n° 1, 1: 5/1-5/4. University of Alexandria.
- EL-NAGA, M. A. (1981). *Nutrition of domestic animals*. REMDENE n° 2, 1: 3/1-3/8. University of Alexandria.
- EL-NAGA, M. A. (1982). *Nutrition of domestic animals*. REMDENE n° 3, 1: 4/1-4/26. University of Alexandria.
- EL-SHARKAWI, H. (1961). *Ecological and sociological studies of the plant communities of the Fuka-Ras el Hikma area western desert of Egypt*. MSc thesis. University of Alexandria.
- EL-SHARKAWI, H. (1977). *Water flow and productivity in the ecosystem*. SAMDENE n° 3, 1: 4/1-4/11. University of Alexandria.
- EL-SHARKAWI, H. (1978). *Water flow and productivity in the ecosystem*. SAMDENE n° 4, 1: 5/1-5/45. University of Alexandria.
- EL SHARKAWI, H. (1979). *Water flow and productivity*. SAMDENE n° 5, 1: 3/1-3/31. University of Alexandria.
- FAO (1970a). *Pre-investment survey of the northwest coastal region comprehensive account on the project*. Technical Report n° 1. ESE: SF/UAR 49, FAO, Rome. 109 p.
- FAO (1970b). *Pre-investment survey of the northwest coastal region, United Arab Republic*. Technical Report n° 3. ESE: SF/UAR 49, FAO, Rome. 335 p.
- FANTOLI, A. (1952) *Le piogge della Libia*. Arti Grafici Editrice.
- FATHY, A. M. & A. M. MEHANNA (1980). Water studies. In: AYYAD, M. A. (ed.), *Regional Environmental Management of Mediterranean Desert Ecosystems of Northern Egypt (SAMDENE)*. Progress report n° 1. University of Alexandria. 41 p.
- FLORET, C. (1981). The effects of protection on steppic vegetation in the Mediterranean arid zone of southern Tunisia. *Vegetatio*: 46.117-129.
- FLORET, C. & E. LE FLOCH (1973). *Production, sensibilité et évolution de la végétation et du milieu en Tunisie pré-saharienne*. Document n° 71. CEPE/CNRS, Montpellier. 45 p.
- FLORET, C., E. LE FLOCH & R. PONTANIER (1983). Phytomasse et production en Tunisie présaharienne. *Acta Oecol., Oecol. Pl.* 4 (18): 133-152.
- FLORET, C., E. LE FLOCH, R. PONTANIER & F. ROMANE (1978). Simulation of the impact of different levels of human pressure on the grazing lands in Southern Tunisia. In: Hyder, D. N. (ed.) *Proceedings of the 1st International Range-land Congress*: 52-54. 1978 August 14-18. Society for Range Management, Denver.
- FLORET, C., E. LE FLOCH, F. ROMANE & R. PONTANIER (1981). Dynamique de systèmes écologiques de la zone aride. *Acta Oecol., Oecol. Appl.* 2: 195-214.
- GALAL, E. S. F., N. G. SELIGMAN, H. MANSOUR, A. M. ABOUL NAGA, A. M. EL-SERAFY & H. K. ALMADDY (1990). *Multiple criterium analysis of lamb production systems in the North-Western coastal zone in Egypt*. Cooperative Arid Lands Agriculture Research Program (CALAR), San Diego State University Foundation. 46 p.
- GHABBOUR, S. I. (1976). *Environmental and development of coastal desert*. International Seminar on Development and Management of Resources of coastal Areas, Berlin. 27 p.
- GHABBOUR, S. I. (1983). *Pre-proposal report for agricultural development in the NW coastal zone of Egypt: integrating barley cultivation and sheep herding*. Institute of Africa Development, University of Cairo. 49 p.
- GIRGIS, W. A. (1970). Phytosociological studies on the vegetation of Mariut area project. *Egypt. J. Bot.* 13: 235-254.
- GIRGIS, W. A. (1973). Phytosociological studies on the vegetation of Ras-el-Hikma-Mersa Matruh coastal plain. *Egypt. J. Bot.* 16: 393-409.
- HAMMOUDA, S.A.K. (1988). *A study of vegetation and land-use in the western Mediterranean desert of Egypt*. PhD thesis. University of Alexandria. 205 p.
- HERMANS, M. (1982). *An autoecological study of Mediterranean desert species at El Omayed, Egypt. III Gymnocarpos decandrum, Rumex pictus, Echiochilon fruticosum & Plantago albicans*. Student Report. University of Nijmegen.
- IBRAHIM, K. M. (1968). Some important native browse and forb forage plant of northern UAR. Their ecology in relation to range management. *Pakistan J. Forest.* 18: 155-168.
- IMAM, M. (1978). *Seed studies*. SAMDENE n° 2, 1: 6/1-6/66. University of Alexandria.
- IMAM, M. (1979). Seed and seedling studies. In: GHABBOUR, S. I. & M. KASSAS (eds.), *Analysis and Management of Mediterranean desert ecosystems*: 110-113. Proceedings of the International Workshop of SAMDENE Project. University of Alexandria.
- JAFRI, S. M. H. & A. A. EL GADI (eds) (1977-1989). *Flora of Libya*. Al Faateh University, Tripoli.
- KASSAS, M. (1971). Dynamic of desert vegetation. In: H. ODABASI & S. E. ULUG (eds.), *Environmental problems and their international implications*: 27-46. Colorado Association University Press.

- KASSAS, M. (1972). A brief history of land-use in Mareotis region, Egypt. *Minerva Biol.* 1: 167-174.
- KASSAS, M. (1979). Mareotis: past, present and future. In: GHABBOUR, S. I. & M. KASSAS (eds.), *Analysis and Management of Mediterranean desert ecosystems*: 24-28. Proceedings of the International Workshop of SAMDENE Project. University of Alexandria.
- KASSAS, M. & W. A. GIRGIS (1964). Habitat and plant communities in the Egyptian Desert.: V The limestone plateau. *J. Ecol.* 52: 107-119.
- KASSAS, M. & M. IMAM (1954). Habitat and plant communities in the Egyptian desert. III The wadi bed ecosystem. *J. Ecol.* 42: 424-441.
- KEITH, H. G. (1965). *A preliminary check list of the Libyan flora*. Ministry of Agriculture, Tripoli.
- LE HOUÉROU, H. N. (1959). *Recherches écologiques et floristiques sur la végétation de la Tunisie Méridionale*. PhD thesis. 2 vol. Institut de Recherches Sahariennes, Algier. 510 p.
- LE HOUÉROU, H. N. (1962). *Les pâturages naturels de la Tunisie aride et désertique*. Institut des Sciences Economiques Appliquées, Paris-Tunis. 106 p.
- LE HOUÉROU, H. N. (1965). *Improvement of natural pasture and fodder resources. Report to the Government of Libya*. EPTA report n° 1979. Plant Production & Protection Division, FAO. 51 p.
- LE HOUÉROU, H. N. (1969). La végétation de la Tunisie steppique. *Ann. Inst. Natl. Rech. Agron. Tunisie* 42(5): 1-624.
- LE HOUÉROU, H. N. (1975). Les pâturages naturels de l'Afrique du Nord: typologie, production, productivité et développement. In: *Inventaire et cartographie des pâturages tropicaux africains*: 41-55. Actes du Colloque de Bamako (Mali), 3-8 mars 1975. Centre International pour l'Elevage en Afrique (CIPEA), Addis Abeba.
- LE HOUÉROU, H. N. (1976). Contribution à une bibliographie écologique des régions arides de l'Afrique et de l'Asie du Sud-Ouest (végétation, pâturages, élevage, agriculture, nomadisme et désertification). In: MONOD, T. (ed.), *La désertification au sud du Sahara*: 169-212. Actes du colloque tenu à Nouakchott, 17-19 décembre 1973. NEA, Dakar-Abidjan.
- LE HOUÉROU, H. N. (1984). Outline of the bioclimatology of Libya. *Bull. Soc. Bot. France, Actual. Bot.* 131: 157-178.
- LE HOUÉROU, H. N. (1989). Classification écoclimatique des zones arides (s.l.) de l'Afrique du Nord. *Ecol. Medit.* 15(3/4): 95-143.
- LE HOUÉROU, H. N. (1992a). Relations entre la variabilité des précipitations et celles de la production primaire et secondaire en zone aride. In: LE FLOC'H, E., M. GROUZIS, A. CORNET & J. C. BILLE (eds.), *L'aridité, une contrainte au développement*: 193-216. ORSTOM, Paris.
- LE HOUÉROU, H. N. (1992b). Rangeland management in Northern Africa and the Near East: evolution, trends and development outlook. In: GASTON, A., M. KERNICK & H. N. LE HOUÉROU (eds.), *Proceedings of the 4th International Rangeland Congress* 1: 544-553. CIRAD, Montpellier.
- LE HOUÉROU, H. N. (1992c). Feeding shrubs to sheep in the Mediterranean arid zone. In: GASTON, A., M. KERNICK & H. N. LE HOUÉROU (eds.), *Proceedings of the 4th International Rangeland Congress* 2: 639-644. CIRAD-UCIST, Montpellier.
- LE HOUÉROU, H. N. (1992d). The role of saltbushes (*Atriplex* spp.) in arid land rehabilitation in the Mediterranean Basin: a review. *Agroforest. Systems* 18: 107-148.
- LE HOUÉROU, H. N. (1995). *Bioclimatologie et biogéographie des steppes arides du Nord de l'Afrique - Diversité biologique, développement durable et désertisation*. CIHEAM, Montpellier.
- LE HOUÉROU, H. N. (1997a). *Germplasm for Arid Land Rehabilitation: NW Egypt and Jordan*. Facilitation Unit, ICARDA, Cairo. 91 p.
- LE HOUÉROU, H. N. (1997b). Biogeography of the arid steppeland North of the Sahara. In: BARAKAT, H. N. & A. K. HEGAZY (eds.), *Reviews in Ecology: Desert Conservation and Development*: 207-228. University of Cairo.
- LE HOUÉROU, H. N. (1998a). Restoration and rehabilitation of arid and semi-arid Mediterranean-type vegetation and ecosystems in Western Asia and Northern Africa (WANA): a review. *Arid Soils Res. Rehabilit.* 14: 3-14.
- LE HOUÉROU, H. N. (1998b). *Fodder shrubs development in the NW coast of Egypt. Report to the Matrouh Resource Management Project*. Facilitation Unit, ICARDA, Cairo. 23 p.
- LE HOUÉROU, H. N. (1998c). *Fodder production from multipurpose trees and shrubs in the eastern slopes of the West Bank. Report to the Palestinian Authority*. Facilitation Unit, ICARDA, Cairo. 24 p.
- LE HOUÉROU, H. N. (1998d). *Outline of a strategy for rangeland and feed resources development in the Arabian Peninsula. Report to the Arabian Peninsula Regional Programme (APRP)*. ICARDA, Dubai. 15 p.

- LE HOUÉROU, H. N. (1998e). *Biodiversity: native plant Resource Conservation in Marmarica. Report to the Matrouh Resource Management Project*. ICARDA, Cairo. 13 p.
- LE HOUÉROU, H. N. (2001). Biogeography of the arid steppeland north of the Sahara. *J. Arid Environm.* 48: 103-128
- LE FLOC'H, E. (1981). *Mapping of land occupation*. REMDENE n° 2, 1: 5/1-5/2. University of Alexandria.
- LE FLOC'H, E. (1983). *Contribution à une étude ethnobotanique de la flore tunisienne*. Imprimerie Officielle de la République Tunisienne.
- LONG, G. A. (1955). The study of natural vegetation as a basis for pasture improvement in the western desert of Egypt. *Bull. Inst. Désert Egypte* 5(2): 18-45.
- LONG, G. A. (1955). *Grazing problems in the western desert of Egypt*. Plant Production & Protection Division, 55/4/2/2497, FAO. 37 p.
- LONG, G. A. & M. A. AYYAD (1956). *Phytoecological map of Ras el Hekma*. Plant Production & Protection Division, 56/9/7130, FAO. 38 p.
- LONG, G. A. (1978). *Premières propositions pour un programme de cartographie des ressources renouvelables et des terres concernant la zone cotière du désert occidental Egyptien*. Ecothèque Méditerranéenne, CEPE/CNRS, Montpellier. 21 p.
- LONG, G. A. (1979). Mapping of renewable resources for land development and land-use decision with special references to the coastal western desert of Egypt. In: GHABBOUR, S. I. & M. KASSAS (eds.), *Analysis and Management of Mediterranean desert ecosystems*: 37-60. Proceedings of the International Workshop of SAMDENE Project. University of Alexandria.
- MAGAZZINI, A. (1963). *Medie climatici mensili ed annuali per la Libia*. Meteorological Service Ministry of Communications, Tripoli. 36p.
- MIGAHID, A. M. (1958). *Plants as ground water indicators in desert areas*. Training course on hydrology of arid and semi-arid regions. Desert Research Institute, UNESCO, Cairo. 13 p.
- MIGAHID, A. M. & M. A. AYYAD (1959a). An ecological study of Ras el Hikma district. I The climatic environment of the vegetation. *Bull. Inst. Désert Egypte* 9(2): 1-45.
- MIGAHID, A. M. & M. A. AYYAD (1959b). An ecological study of Ras el Hikma district. II The factor of soil water content. *Bull. Inst. Désert Egypte* 9(2): 46-73.
- MIGAHID, A. M. & M. A. AYYAD (1959c). An ecological study of Ras el Hikma district. III Plant habitats and communities. *Bull. Inst. Désert Egypte* 9(2): 74-98.
- MIGAHID, A. M., A. A. ABD EL RAHMAN, A. M. EL-SHAFFEY & M. A. HAMMOUDA (1955). Types of habitat and vegetation at Ras el Hikma. *Bull. Inst. Désert Egypte* 5(2): 107-190.
- MIGAHID, A. M., K. H. BATANOUNY & M. A. F. ZAKI (1971). Phytosociological and ecological study of a sector in the Mediterranean coastal region of Egypt. *Vegetatio* 23: 113-134.
- MIGAHID, A. M. & M. N. EL-SHOURBAGUI (1958). The ecological amplitude of the desert fodder grass «*Panicum turgidum*». II. Edaphic conditions. *Bull. Inst. Désert Egypte* 8(2): 21-65.
- MIGAHID, A. M., H. M. EL-SHARKAWI, K. H. BATANOUNY & A. F. SHALABY (1963). Phytosociological and ecological study of Matkila sector of Sidi-Barrani. I. Sociology of the communities. *Feddes Report*. 84: 747-760.
- PAMPANINI, R. (1931). *Prodromo della flora Cirenaica*. Forli.
- PAMPANINI, R. (1936). Aggiunte e correzioni al «prodromo delle Flora cirenaica». *Arch. Bot. (Forlì)* 12: 17-53.
- PENMAN, H. L. (1948). Natural evaporation from open water, bare soil and grass. *Proc. Roy. Soc. London, Ser. B, Math. Phys. Sci.* 193: 120-145.
- REGNER, H. J. (1997). *Rainfall distribution in the North-South extension at Marsa-Matruh*. El Qasr Rural Development Project GTZ. Marsa Matruh and Eschborn. 16 p.
- SALEM, B. B. M. (1990). *Remote sensing and land-use in the North Western desert of Egypt*. PhD thesis. University of Alexandria.
- SHALOUT, K. H. (1983). *An ecological study on Thymelaea hirsuta (L.) Endl. in Egypt*. PhD thesis. University of Tanta.
- SHALOUT, K. H. (1987). Pattern, phenology and sex ratio of Egyptian Thymelaea hirsuta populations. *Vegetatio* 72: 67-73.
- SHALOUT, K. H. & M. A. AYYAD (1988). Structure and standing crop of Egyptian Thymelaea hirsuta populations. *Vegetatio* 74: 137-142.
- SHALOUT, K. H. & R. EL-GHAREEB (1984). Effet of protection on the phytomass and primary production of ecosystems of the western Mediterranean desert of Egypt. I Ecosystem of non-saline depressions. *Bull. Fac. Sci. Alexandria Univ.* 25: 109-131.

- SHOLTEN, M. E., M. W. A. C HUKKELHOVEN, M. A. AYYAD & M. J. A. WERGER (1981). Vegetation analysis in the coastal dune ecosystem of the western Egyptian desert. *Folia Geobot. Phytotax.* 16: 293-308.
- TÄCKHOLM, V. (1974). *Student's flora of Egypt*. Ed. 2. Cairo University.
- TÄCKHOLM, V. & L. BOULOS (1972). Supplementary notes to student's flora of Egypts. Second edition. *Publ. Cairo Univ. Herb.* 5.
- TADROS, T. M. (1953). A phytosociological study of halophilous communities from Mareotis. *Vegetatio* 4: 103-124.
- TADROS, T. M. (1956). An ecological survey of the semi-arid coastal strip of the eastern desert of Egypt. *Bull. Inst. Désert Egypte* 6(2): 28-56.
- TADROS, T. M. (1958). *Plant communities a ground water indicators and the water economy of some desert communities*. Training course on hydrogeology of arid and semi-arid regions, Desert Research Center, El-Matariya & UNESCO, Cairo. 6 p.
- TADROS, T. M. & B. A. M. ATTA (1958a). Further contributions to the study of sociology and ecology of the halophilous plant communities from Mareotis. *Vegetatio* 8: 137-160.
- TADROS, T. M. & B. A. M. ATTA (1958b). Plant communities of barley fields and uncultivated desert areas of Mareotis. *Vegetatio* 8: 161-175.
- TADROS, T. M. & H. M. EL SHARKAWI (1960a). Phytosociological and ecological studies on the vegetation of Fuka-Ras El Hekma area. I Sociology of the communities. *Bull. Inst. Désert Egypte* 10(1): 37-60.
- TADROS, T. M. & H. M. EL-SHARKAWI (1960b). Phytosociological and ecological studies on the vegetation of Fuka-Ras El Hekma area. II Consistency and homogeneity of the open desert communities. *Bull. Inst. Désert Egypte* 10(1): 61-83.
- TADROS, T. M. & H. M. EL-SHARKAWI (1960c). Phytosociological and ecological studies on the vegetation of Fuka-Ras El Hekma area. III A vegetation map of the area. *Bull. Inst. Désert Egypte* 10(1): 85-93.
- VAN DUVENBODEN, N. (1985). *Animal Husbandry in the North-Western Coastal Zone of Egypt*. Theoretical Production Ecology. CABO, Wageningen. 52 p.
- VAN DUVENBODEN, N. (1987). *Evaluation of Animal Husbandry in the North-Western Coastal Zone of Egypt. (Literature Review and Simulation)*. CABO Publishing n° 72, Wageningen. 204 p.
- VAN DUVENBODEN, N. (1988). *The Effect of Grazing on the Growth of Subshrubs and the Water Balance in the North Western Coastal Zone of Egypt. (Measurement and Simulation)*. Theoretical Production Ecology. CABO, Wageningen. 191 p.
- VAN DUVENBODEN, N. (1989). Contributions of various feed components to feed availability in integrated barley/livestock systems in the north-western coastal zone of Egypt: a simulation study. *J. Arid Environm.* 16: 217-228.
- VAN KEULEN, H. & G. W. J. VAN DE VEN (1988). Application of interactive multiple goal linear programming techniques for analysis and planning of regional agricultural development: a case study for the Mariut region (Egypt). In: J. M. BOUSSARD (ed.), *Agriculture: Socio-Economic Factors in Land Evaluation*: 36-57. Proceedings of a conference held in Brussels 7-9 oct. 1987. OPOCE, Luxembourg.
- VAN DER VEEN, J. P. H. Z. ABU GUENDIA & A. NASSEF, A. (1968). *Report on range carrying capacity survey, NW Coastal Zone*. UAR. EGDDO/UNSF/FAO Pre-investment survey of NW coastal region project. UAR, FAO, Rome, Ministry of Agriculture, Cairo. 22 p. & 1 map 1:500000.
- WALTER H. & H. LIETH (1960). *Klimadiagramm Weltatlas*. Veb Gustav Fisher Verlag.
- ZAHRAN, M. A. (1986). Forage potentialities of Kochia indica and K. prostrata in arid land, with particular reference to Saudi Arabia. *Arab Gulf J. Sci. Res.* 4: 53-68.
- ZAHRAN, M. A., B. K. MUHAMMAD & A. A. EL-DINGAWI (1992). Establishment of Kochia forage halophytes in the salt affected lands of the Arab countries. *J. Environm. Sci. Mansoura Univ.* 4: 93-113.
- ZAHRAN, M. A. & A. J. WILLIS (1992). *The vegetation of Egypt*. Chapman & Hall.

**Table 3. – Plant biodiversity table (see pp. 282-307)**

| Genus            | Species          | Family         | Vernacular name       | Frequency | Area of distribution | Biological type | Life span | Habitat     | Utilization | Grazing value | Remarks |
|------------------|------------------|----------------|-----------------------|-----------|----------------------|-----------------|-----------|-------------|-------------|---------------|---------|
| Adiantum         | capillus-veneris | Adiantaceae    | Kozbaartel Bir        | FC        | I-VI                 | F               | P         | Can-Wad     | 0m          | 0             | Hyg     |
| Aizoon           | canariense       | Aizoaceae      | Grassool              | CC        | I-III                | CH              | A         | Ste-Wld     | Non         | 0             | Nit     |
| Aizoon           | hispanicum       | Aizoaceae      | Grassool              | FR        | I-II                 | CH              | A         | Ste-Wld     | Non         | 0             | Nit     |
| Mesembryanthemum | crystallinum     | Aizoaceae      | Grassool              | CC        | I-III                | CH              | A         | Wld         | Non         | 0             | Hal     |
| Mesembryanthemum | nodiflorum       | Aizoaceae      | Grassool              | CC        | I-III                | CH              | A         | Rge-Wld     | Non         | 0             | Nit     |
| Ophiorhynchus    | forskallii       | Aizoaceae      | Chassool              | CC        | I-III                | CH              | A         | Slt-Wld     | Non         | 0             | Hal     |
| Ophiophytum      | gramineum        | Alismataceae   | -                     | FR        | I-II                 | H               | P         | Can-Frw     | Non         | 0             | Hyd     |
| Alisma           | alisma           | Alismataceae   | -                     | FR        | I-II                 | H               | P         | Can-Frw     | Non         | 0             | Hyd     |
| Damasonium       | caudatum         | Amaranthaceae  | Fisa al Kalb          | FC        | I-II                 | H               | A         | Wld         | Non         | 0             | Wee     |
| Amaranthus       | cruentus         | Amaranthaceae  | Ruaf                  | C         | I-II                 | H               | A         | Wld         | Non         | 0             | Wee     |
| Amaranthus       | graecizans       | Amaranthaceae  | -                     | CC        | I-II                 | H               | A         | Wld         | Non         | 0             | Wee     |
| Amaranthus       | retroflexus      | Amaranthaceae  | -                     | R         | I-II                 | H               | A         | Wld         | Non         | 0             | Wee     |
| Amaranthus       | silvestris       | Amaranthaceae  | -                     | C         | I-II                 | H               | A         | Wld         | Non         | 0             | Wee     |
| Amaranthus       | tricolor         | Amaranthaceae  | -                     | R         | I-II                 | H               | A         | Wld         | Non         | 0             | Wee     |
| Amaranthus       | viridis          | Amaranthaceae  | -                     | CC        | I-II                 | H               | A         | Wld         | Non         | 0             | Wee     |
| Convolvula       | monacanththa     | Amaranthaceae  | Amarantoun            | FC        | II-IV                | CS              | P         | Des-Snd     | Gra-Med     | 3             | Gly-Psa |
| Narcissus        | tazetta          | Amaryllidaceae | Haad                  | R         | I-II                 | H               | P         | Wet-Wld     | Med-Orn     | 1             | Hyg     |
| Pancratium       | arabicum         | Amaryllidaceae | Nargis                | R         | I-II                 | H               | P         | Coa-Snd     | 0m          | 1             | Wee     |
| Pancratium       | maritimum        | Amaryllidaceae | Sawsan                | CC        | I                    | H               | P         | Coa-Snd     | 0m          | 1             | Hal     |
| Pistacia         | attantica        | Anacardiaceae  | Sawsan                | RR        | I-III                | T               | P         | Des-Wad     | Fue-Gra-Med | 2             | Phr     |
| Pistacia         | lentiscus        | Anacardiaceae  | Batoum                | RR        | I-II                 | HS              | P         | Cli-Wad     | Fue-Gra-Med | 2             | Cha     |
| Rhus             | tripartita       | Anacardiaceae  | Za'iroor, Batoum Derv | RR        | I-III                | HS              | P         | Cli-Run-Wad | Fen-Gra-Med | 2             | Cha     |
| Nerium           | oleander         | Apocynaceae    | Aren, Gdari, Em       | RR        | I-II                 | HS              | P         | Run-Wad     | Med-Orn     | 1             | Nat-Phr |
| Arisarum         | vulgare          | Araceae        | Defla                 | R         | I-II                 | H               | P         | Rge-Wld     | Med         | 1             | Wee     |
| Eminium          | speculatum       | Araceae        | Neirish               | C         | I-II                 | H               | P         | Wet         | Non         | 0             | Wee     |
| Asclepias        | fruticosa        | Asclepiadaceae | Erkeita               | C         | I-II                 | H               | P         | Roc         | Non         | 1             | Cha     |
| Calotropis       | procera          | Asclepiadaceae | Gheil                 | R         | I-II                 | HS              | P         | Irr         | Non         | 1             | Wee     |
| Caralluma        | europea          | Asclepiadaceae | Asclepiad Krom Berry  | FR        | II-V                 | HS              | P         | Rge-Roc     | Non         | 0             | Cha     |
| Cynanchum        | acutum           | Asclepiadaceae | Dalmous               | R         | I-II                 | SU              | P         | Irr         | Non         | 1             | Wee     |
| Pergularia       | tomentosa        | Asclepiadaceae | Olatiq, Muddled       | FC        | I-III                | H               | P         | Med         | 0m          | 0             | Wee     |
| Periploca        | leontopetalum    | Asclepiadaceae | -                     | FC        | I-III                | Fr              | P         | Cli-Roc-Run | Fsh-Gra     | 4             | Cha     |
| Leontice         | lehmannii        | Berberidaceae  | Halla                 | FR        | I-II                 | H               | P         | Cul-Wld     | Cul-Rge     | 1             | Psa     |
| Alkanna          | orientalis       | Boraginaceae   | Rakaf                 | R         | I-II                 | H               | P         | Cul-Rge     | Gra-Med     | 2             | Cha     |
| Anchusa          | aegyptiaca       | Boraginaceae   | Hima el Ghoul         | CC        | I-III                | H               | P         | Cul-Run     | Gra         | 1             | Psa     |
| Anchusa          | hispida          | Boraginaceae   | Libbeid               | R         | I-III                | H               | A         | Cul-Rge     | Gra         | 2             | Psa     |
| Anchusa          | humilis          | Boraginaceae   | Kahla                 | CC        | I-II                 | H               | A         | Cul-Rge     | Gra         | 1             | Psa     |
| Anchusa          | milleri          | Boraginaceae   | Kahla                 | FC        | I-II                 | H               | A         | Cul-Rge     | Gra         | 1             | Psa     |
| Anchusa          | undulata         | Boraginaceae   | Kahla                 | R         | I-III                | H               | A         | Cul-Rge     | Gra         | 1             | Psa     |
| Arnebia          | decumbens        | Boraginaceae   | Attan                 | FC        | I-III                | H               | A         | Rge-Snd-Ste | Gra         | 3             | Psa-Tac |

| Genus          | Species              | Family          | Vernacular name | Frequency                  | Area of distribution | Biological type | Life span | Habitat     | Utilization     | Grazing value | Remarks |     |
|----------------|----------------------|-----------------|-----------------|----------------------------|----------------------|-----------------|-----------|-------------|-----------------|---------------|---------|-----|
| <i>Arnebia</i> | <i>linearifolia</i>  | Boraginaceae    | Kahla           | FC                         | I-II                 | H               | A         | Rge-Snd     | Gra             | 2             | Psa     |     |
| Borago         | <i>officinalis</i>   | Boraginaceae    | -               | FR                         | I-II                 | H               | A         | Cul         | Non             | 1             | Psa     |     |
| Buglossoides   | <i>incassatum</i>    | Boraginaceae    | -               | R                          | I-III                | H               | A         | Cul-Rge     | Non             | 0             | Wee     |     |
| Buglossoides   | <i>tenuiflora</i>    | Boraginaceae    | -               | FR                         | I-III                | H               | A         | Cul-Rge     | Non             | 0             | Wee     |     |
| Echium         | <i>angustifolium</i> | Boraginaceae    | -               | CC                         | I-II                 | H               | P         | Cul-Rge-Wld | Non             | 0             | Wee     |     |
| Echium         | <i>glomeratum</i>    | Boraginaceae    | -               | R                          | I-II                 | H               | P         | Wld         | Non             | 0             | Wee     |     |
| Echium         | <i>plantagineum</i>  | Boraginaceae    | -               | RR                         | I-II                 | H               | A         | Cul-Wld     | Gra-Med         | 1             | Wee     |     |
| Echium         | <i>rauwolfii</i>     | Boraginaceae    | -               | CC                         | I-II                 | H               | A-B       | Cul-Rge-Ste | Gra             | 1             | Wee     |     |
| Echium         | <i>rubrum</i>        | Boraginaceae    | -               | C                          | I-II                 | H               | A         | Wld         | Non             | 0             | Wee     |     |
| Echium         | <i>sabulicola</i>    | Boraginaceae    | -               | R                          | I-II                 | H               | A         | Wld         | Non             | 0             | Wee     |     |
| Echium         | <i>sericeum</i>      | Boraginaceae    | -               | C                          | I-III                | H               | DS        | P           | Rge-Snd-Ste-Wld | Non           | 0       | Psa |
| Echium         | <i>fruticosum</i>    | Boraginaceae    | -               | FC                         | I-II                 | H               | Fr        | P           | Rge-Snd-Ste     | Gra           | 4       | Psa |
| Echichilon     | <i>arbainense</i>    | Boraginaceae    | -               | Okroosh                    | I-II                 | DS              | P         | Rge-Snd-Ste | Gra             | 2             | Ere     |     |
| Heliotropium   | <i>curassavicum</i>  | Boraginaceae    | -               | Atana                      | I-II                 | H               | P         | Des-Wld     | Gra             | 2             | Ere     |     |
| Heliotropium   | <i>dignum</i>        | Boraginaceae    | -               | Roghli, S'gaa              | I-II                 | H               | P         | Sit         | Non             | 1             | Hal     |     |
| Heliotropium   | <i>europaeum</i>     | Boraginaceae    | -               | Aqarabana                  | I-II                 | H               | P         | Des-Rge-Ste | Gra-Med         | 2             | Ere     |     |
| Heliotropium   | <i>hirsutissimum</i> | Boraginaceae    | -               | RR                         | I-II                 | H               | A         | Cul         | Non             | 0             | Wee     |     |
| Heliotropium   | <i>supinum</i>       | Boraginaceae    | -               | C                          | I-III                | H               | A         | Cul         | Non             | 0             | Psa     |     |
| Lapula         | <i>spinocarpos</i>   | Boraginaceae    | -               | Qaliet                     | I-III                | H               | A         | Rge-Ste     | Gra             | 2             | Psa-Tac |     |
| Moltkiopsis    | <i>ciliata</i>       | Boraginaceae    | -               | Halama                     | I-II                 | H               | P         | Des-Rge-Ste | Gra-Med         | 3             | Psa     |     |
| Nonea          | <i>melanocarpa</i>   | Boraginaceae    | -               | FR                         | I-II                 | H               | A         | Cul-Rge     | Gra             | 1             | Wee     |     |
| Nonea          | <i>vivianii</i>      | Boraginaceae    | -               | FR                         | I-II                 | H               | A         | Rge-Snd-Ste | Gra             | 2             | Psa     |     |
| Ogastemma      | <i>pusillum</i>      | Boraginaceae    | -               | R                          | I-III                | H               | A         | Rge-Ste     | Gra             | 2-3           | Psa-Tac |     |
| Trichodesma    | <i>africanum</i>     | Boraginaceae    | -               | FC                         | I-II                 | H               | A-B       | Des-Wld     | Gra             | 1-2           | Psa     |     |
| Campanula      | <i>erinus</i>        | Campanulaceae   | -               | RR                         | I-II                 | H               | A         | Ir-Wld      | Non             | 0             | Wee     |     |
| Capparis       | <i>rupestris</i>     | Capparaceae     | -               | CC                         | I-III                | H               | TS        | P           | Cli-Roc-Wld     | Med-Orn       | 0       | Cha |
| Capparis       | <i>spinosa</i>       | Capparaceae     | -               | C                          | I-II                 | H               | TS        | P           | Cli-Roc-Wld     | Med-Orn       | 0       | Ere |
| Arenaria       | <i>serpyllifolia</i> | Caryophyllaceae | -               | Labdakh                    | I-II                 | H               | A         | Cul         | Gra             | 0             | Wee     |     |
| Gymnocarpus    | <i>decedens</i>      | Caryophyllaceae | -               | Jard Garad                 | I-IV                 | DS              | P         | Sha-Ste     | Gra             | 4             | Ere     |     |
| Hennaria       | <i>cinerea</i>       | Caryophyllaceae | -               | FC                         | I-II                 | H               | A         | Rge-Sha     | Med             | 0             | Wee     |     |
| Hennaria       | <i>cyrenaica</i>     | Caryophyllaceae | -               | RR                         | I-II                 | H               | P         | Rge-Sha     | Gra             | 1             | Ere     |     |
| Hennaria       | <i>fontanesii</i>    | Caryophyllaceae | -               | CC                         | I-III                | H               | P         | Rge-Sha     | Gra             | 1             | Ere     |     |
| Hennaria       | <i>hemistemon</i>    | Caryophyllaceae | -               | RR                         | I-III                | H               | A         | Cul         | Med             | 2             | Wee     |     |
| Hennaria       | <i>hirsuta</i>       | Caryophyllaceae | -               | FC                         | I-III                | H               | A         | Rge-Snd-Ste | Gra             | 1             | Tac     |     |
| Loefflingia    | <i>hispanica</i>     | Caryophyllaceae | -               | Mouker, Makir              | I-II                 | H               | A         | Cul-Roc-Run | Gra             | 1-2           | Cha-Psa |     |
| Minuartia      | <i>hybrida</i>       | Caryophyllaceae | -               | RR                         | I-II                 | H               | A         | Cul-Roc-Run | Gra             | 1-2           | Cha     |     |
| Minuartia      | <i>mediterranea</i>  | Caryophyllaceae | -               | RR                         | I-II                 | H               | A         | Snd-Ste     | Gra-Med         | 1-2           | Psa     |     |
| Paronychia     | <i>arabica</i>       | Caryophyllaceae | -               | C                          | I-III                | H               | P         | Rge-Ste     | Gra             | 2             | Psa     |     |
| Paronychia     | <i>argentea</i>      | Caryophyllaceae | -               | Bessat el Ard, Tâl el Areb | I-III                | H               | P         | Snd-Ste     | Gra-Med         | 1-2           | Psa     |     |
| Paronychia     | <i>capitata</i>      | Caryophyllaceae | -               | R                          | I-III                | H               | -         | -           | -               | -             | -       |     |

| Genus         | Species         | Family           | Vernacular name    | Frequency | Area of distribution | Biological type | Life span | Habitat      | Utilization | Grazing value | Remarks         |
|---------------|-----------------|------------------|--------------------|-----------|----------------------|-----------------|-----------|--------------|-------------|---------------|-----------------|
| Petrohragia   | illyrica        | Caryophyllaceae  | Sammah             | FR        | I-II                 | Fr              | P         | Cli-Run      | Gra         | 2             | Cha             |
| Polygonum     | robusta         | Caryophyllaceae  | Mokoor             | R         | III-VI               | A-Sh            | Des-Rge   | Gra          | 2           | Ere-Tac       |                 |
| Polygonum     | succulentum     | Caryophyllaceae  | -                  | CC        | I-II                 | Su              | A         | Cul-Snd      | Non         | 0             | Gly-Hal-Wee     |
| Polygonum     | tetraphyllum    | Caryophyllaceae  | -                  | C         | I-II                 | Su              | A         | Cul-Snd      | Non         | 0             | Gly-Hal-Tac-Wee |
| Polygonum     | dochotomus      | Caryophyllaceae  | -                  | FC        | I-IV                 | CH              | A         | Sit          | Non         | 0             | SO4             |
| Pteranthus    | geniculata      | Caryophyllaceae  | Heriba             | FR        | I-II                 | H               | A         | Oli-Roc-Run  | Non         | 1-2           | Cha-Psa         |
| Rhodalsine    | aegyptiaca      | Caryophyllaceae  | -                  | RR        | I-III                | H               | A         | Cul          | Non         | 0             | Wee             |
| Silene        | apetala         | Caryophyllaceae  | Deneina            | FC        | I-II                 | H               | A         | Cul          | Non         | 0             | Wee             |
| Silene        | behen           | Caryophyllaceae  | Deneina            | R         | I-II                 | H               | A         | Cul          | Non         | 1             | Wee             |
| Silene        | biappendiculata | Caryophyllaceae  | Deneina            | C         | I-II                 | H               | A         | Cul-Snd-Site | Non         | 0             | End-Wee         |
| Silene        | colorata        | Caryophyllaceae  | Deneina            | C         | I-III                | H               | A         | Cul-Snd      | Non         | 0             | Wee             |
| Silene        | fruticosa       | Caryophyllaceae  | -                  | RR        | I-II                 | Fr              | P         | Cli-Roc      | Gra         | 1-2           | Cha-End         |
| Silene        | nocturna        | Caryophyllaceae  | Deneina Abul Nagaf | FC        | I-II                 | H               | A         | Cul          | Non         | 0             | Wee             |
| Silene        | rubella         | Caryophyllaceae  | Nashash            | C         | I-II                 | H               | A         | Cul-Rge      | Gra         | 0             | Wee             |
| Silene        | succulenta      | Caryophyllaceae  | Atar el Bhar       | C         | I-                   | Su              | P         | Coa-Snd      | Non         | 0             | Psa             |
| Silene        | tridentata      | Caryophyllaceae  | Deneina            | R         | I-II                 | H               | A         | Cul-Rge      | Non         | 0             | Wee             |
| Silene        | villosa         | Caryophyllaceae  | Attan              | R         | II-IV                | H               | A         | Con-Snd      | Gra         | 1-2           | Psa             |
| Silene        | vivianii        | Caryophyllaceae  | Deneina            | FC        | I-II                 | H               | A         | Cul          | Non         | 0             | Wee             |
| Silene        | vulgaris        | Caryophyllaceae  | -                  | R         | I-II                 | H               | P         | Cli          | Gra         | 1-2           | Cha             |
| Spergula      | fallax          | Caryophyllaceae  | Rihay              | C         | I-II                 | H               | A         | Cul          | Non         | 0             | Gly-Hal-Wee     |
| Spergularia   | bocconei        | Caryophyllaceae  | -                  | R         | I-II                 | H               | A         | Cul          | Non         | 0             | Hal-Wee         |
| Spergularia   | diandra         | Caryophyllaceae  | -                  | CC        | I-II                 | CH              | P         | Cul-Wld      | Non         | 0             | Gly-Hal-Wee     |
| Spergularia   | marina          | Caryophyllaceae  | Abu Ghulam         | CC        | I-III                | CH              | P         | Sit          | Gra         | 3-4           | Hal             |
| Spergularia   | maritima        | Caryophyllaceae  | Meshit             | R         | I-II                 | H               | A         | Cul-Wld      | Med         | 0             | Nit-Wee         |
| Spergularia   | rubra           | Caryophyllaceae  | Estba Hamra        | R         | I-II                 | CH              | A         | Cul-Wld      | Med         | 0             | Hal-Wee         |
| Spergularia   | media           | Caryophyllaceae  | Qizzaza, Bughian   | R         | I-II                 | CH              | A         | Cul-Wld      | Non         | 0             | Nit             |
| Stellaria     | pallida         | Caryophyllaceae  | Qizzaza            | CC        | I-II                 | CH              | A         | Cul-Wld      | Non         | 0             | Wee             |
| Vaccaria      | pyramidalis     | Caryophyllaceae  | Foul el Arab       | C         | I-II                 | H               | A         | Cul          | Med         | 0             | Wee             |
| Ceratophyllum | demersum        | Ceratophyllaceae | Horeish            | C         | I-II                 | H               | P         | Fw           | Non         | 0             | Hyd             |
| Arabis        | articulata      | Chenopodiaceae   | Bebel              | CC        | II-IV                | CS              | P         | Roc-Sha-Ste  | Gra         | 1             | Gly             |
| Arabis        | oropedium       | Chenopodiaceae   | Ajrem              | CC        | I-II                 | DS              | P         | Roc-Sha-Ste  | Gra         | 3             | Gly-Sil         |
| Arthroceratum | macrostachyum   | Chenopodiaceae   | Shinaan            | C         | I-III                | CS              | P         | Sit          | Gra         | 1             | Hal             |
| Atriplex      | coriacea        | Chenopodiaceae   | Ratam              | R         | I-II                 | CS              | P         | Sit-Wet      | Gra         | 2             | Hal             |
| Atriplex      | glauca          | Chenopodiaceae   | Qetteifa           | FR        | I-III                | TS              | P         | Rge-Ste      | Fsh-Gra     | 3             | Hal             |
| Atriplex      | halimus         | Chenopodiaceae   | Qattaf             | CC        | I-IV                 | CS              | P         | Rge-Sit      | Fsh-Gra-Med | 3             | Hal             |
| Atriplex      | infata          | Chenopodiaceae   | -                  | FR        | I-II                 | CH              | A         | Wild         | Non         | 0             | Hal-Nit-Wee     |
| Atriplex      | leucocoda       | Chenopodiaceae   | Roghl              | R         | I-II                 | HS              | A         | Rge          | Fsh-Gra     | 2-3           | Hal             |
| Atriplex      | littoralis      | Chenopodiaceae   | -                  | R         | I-II                 | H               | A         | Cul-Wld      | Non         | 0             | Hal-Nit         |
| Atriplex      | mollis          | Chenopodiaceae   | Quattaf            | R         | I-II                 | TS              | Sh        | Rge-Sit      | Fsh-Gra     | 3             | Hal             |
| Atriplex      | portulacoides   | Chenopodiaceae   | Qattaf bahri       | C         | I-                   | TS              | P         | Coa-Sit      | Gra         | 2             | Hal             |

| Genus       | Species        | Family         | Vernacular name         | Frequency | Area of distribution | Biological type | Habitat | Life span    | Utilization | Grazing value | Remarks |  |
|-------------|----------------|----------------|-------------------------|-----------|----------------------|-----------------|---------|--------------|-------------|---------------|---------|--|
| Atriplex    | rosea          | Chenopodiaceae | -                       | R         | I-II                 | H               | Cul-Wld | Non          | 0           | Hal-Nit-Wee   |         |  |
| Atriplex    | semibaccata    | Chenopodiaceae | Qattaf                  | FR        | I-II                 | TS              | P       | Sit-Site     | 3           | Hal-Nat       |         |  |
| Atriplex    | spongiosa      | Chenopodiaceae | -                       | R         | I-II                 | CH              | Wld     | Non          | 0           | Hal-Nit-Wee   |         |  |
| Bassia      | arabica        | Chenopodiaceae | Thelata                 | C         | I-II                 | DS              | P       | Rge-Slt-Site | 0           | Hal           |         |  |
| Bassia      | indica         | Chenopodiaceae | -                       | FC        | I-II                 | H               | A-Sh    | Rge-Wld      | 0           | Hal           |         |  |
| Bassia      | muricata       | Chenopodiaceae | Ghobeira                | CC        | I-V                  | H               | A       | Snd-Site     | 2-3         | Nit-Wee       |         |  |
| Beta        | vulgaris       | Chenopodiaceae | Salq, Dirz el Kalb      | FC        | I                    | H               | A       | Slt          | Gra         | 2             | Hal     |  |
| Blitum      | virgatum       | Chenopodiaceae | -                       | R         | I-II                 | H               | A       | Cul          | 0           | Nit           |         |  |
| Chenopodium | album          | Chenopodiaceae | Rokaab al Jamal         | CC        | I-II                 | H               | A       | Cul-Wld      | 0           | Nit-Wee       |         |  |
| Chenopodium | ambrosoides    | Chenopodiaceae | Nitira, Natha           | CC        | I-II                 | H               | A       | Wld          | 0           | Nit-Wee       |         |  |
| Chenopodium | giganteum      | Chenopodiaceae | -                       | RR        | I-II                 | H               | A       | Wld          | 0           | Nit-Wee       |         |  |
| Chenopodium | glaucum        | Chenopodiaceae | -                       | R         | I-III                | H               | A       | Cul-Wld      | 0           | Nit-Wee       |         |  |
| Chenopodium | murale         | Chenopodiaceae | Lisan et Teir, Abu Ifen | CC        | I-II                 | H               | A       | Wld          | 0           | Nit-Wee       |         |  |
| Chenopodium | strobilaceum   | Chenopodiaceae | Sabad                   | C         | I-III                | CS              | P       | Slt          | 0           | Hal           |         |  |
| Chenopodium | amplexicaulis  | Chenopodiaceae | -                       | R         | I-II                 | CH              | A       | Slt          | 0           | Hal           |         |  |
| Chenopodium | perfoliata     | Chenopodiaceae | -                       | R         | I-II                 | CS              | P       | Slt          | 0           | Hal           |         |  |
| Haloxylon   | salicinicum    | Chenopodiaceae | Belbel                  | CC        | I-II                 | CS              | P       | Rge-Snd-Site | 1           | Gly           |         |  |
| Haloxylon   | scoparium      | Chenopodiaceae | Reneth                  | CC        | I-IV                 | DS              | P       | Rge-Site     | 1           | Gly-Sil       |         |  |
| Noaea       | mucronata      | Chenopodiaceae | Athir                   | CC        | I-IV                 | DS              | P       | Roc-Sha-Site | 2           | Gly           |         |  |
| Salicornia  | europea        | Chenopodiaceae | Hamd                    | C         | I-II                 | CH              | A       | Slt          | 0           | Hal           |         |  |
| Salicornia  | fruticosa      | Chenopodiaceae | Hamd                    | C         | I-II                 | CS              | P       | Slt          | 0           | Hal-Pel       |         |  |
| Salicornia  | perennis       | Chenopodiaceae | Hamd                    | C         | I-II                 | CS              | P       | Des-Rga      | 0-1         | Hal-Pel       |         |  |
| Salicornia  | imbicaria      | Chenopodiaceae | Woeid                   | CC        | I-II                 | CS              | P       | Roc-Sha      | 0           | Hal-Pel       |         |  |
| Salicornia  | inermis        | Chenopodiaceae | -                       | FC        | I-II                 | CH              | A       | Coa-Dre      | 1           | Hal           |         |  |
| Salicornia  | kali           | Chenopodiaceae | Eshmaan                 | CC        | I                    | CH              | A       | Coa-Dre      | 0           | Hal-Psa       |         |  |
| Salicornia  | longifolia     | Chenopodiaceae | Heddeid                 | FC        | I-III                | CS              | P       | Slt-Site     | 1           | Hal           |         |  |
| Salicornia  | oppositifolia  | Chenopodiaceae | -                       | R         | I-II                 | CS              | P       | Site-Wld     | 2-3         | Hal           |         |  |
| Salicornia  | schweinfurthii | Chenopodiaceae | -                       | RR        | I-II                 | CS              | P       | Rge-Slt-Site | 0           | Nit           |         |  |
| Salicornia  | tetragona      | Chenopodiaceae | -                       | RR        | I-IV                 | CS              | P       | Slt          | 1           | Hal-Phr       |         |  |
| Salicornia  | tetrandra      | Chenopodiaceae | Damaan                  | R         | I-II                 | CS              | P       | Slt          | 2           | Hal           |         |  |
| Salicornia  | villosa        | Chenopodiaceae | Khareet                 | CC        | I-II                 | CS              | P       | Rge-Sha-Ste  | 2-3         | Hal           |         |  |
| Salicornia  | volvensi       | Chenopodiaceae | Careeba                 | C         | I-II                 | CH              | A       | Coa-Dre-Wld  | 0           | Hal-Psa-Wee   |         |  |
| Suaeda      | aegyptiaca     | Chenopodiaceae | Soweid                  | CC        | I-II                 | CH              | A       | Slt          | 0           | Hal           |         |  |
| Suaeda      | attissima      | Chenopodiaceae | Soweid                  | RR        | I-III                | CS              | P       | Slt          | 0           | Hal           |         |  |
| Suaeda      | palaestina     | Chenopodiaceae | Soweid                  | RR        | I-III                | CS              | P       | Slt          | 1           | Hal           |         |  |
| Suaeda      | prunosa        | Chenopodiaceae | Soweid                  | R         | I-III                | CS              | P       | Slt          | 1           | Hal           |         |  |
| Suaeda      | splendens      | Chenopodiaceae | Soweid                  | RR        | I-II                 | CH              | A       | Slt          | 0           | Hal           |         |  |
| Suaeda      | vera           | Chenopodiaceae | Soweid                  | C         | I-III                | CS              | P       | Slt          | 1           | Hal           |         |  |
| Suaeda      | vermiculata    | Chenopodiaceae | Soweid                  | C         | I-III                | CS              | P       | Slt          | 1           | Hal           |         |  |
| Traganum    | nudatum        | Chenopodiaceae | Dhamran                 | FC        | II-IV                | CS              | P       | Rge-Slt-Site | 2-3         | Hal-SO4       |         |  |

| Genus  | Species        | Family     | Vernacular name        | Frequency | Area of distribution | Biological type | Life span | Habitat         | Utilization | Grazing value | Remarks     |
|--------|----------------|------------|------------------------|-----------|----------------------|-----------------|-----------|-----------------|-------------|---------------|-------------|
| Fumana | arabica        | Cistaceae  | -                      | C         | I-II                 | Fr              | P         | Rge-Sha         | Gra         | 2             | Cha         |
|        | thymifolia     | Cistaceae  | -                      | R         | I-II                 | Fr              | P         | Rge-Sha         | Gra         | 2             | Cha         |
|        | aegyptiacum    | Cistaceae  | Koshein                | R         | I-II                 | H               | A         | Rge             | Gra         | 2             | Psa         |
|        | ciliatum       | Cistaceae  | Koshein                | C         | I-II                 | Fr              | P         | Rge-Sha         | Gra         | 2-3           | Cha         |
|        | karinicum      | Cistaceae  | Koshein                | CC        | I-III                | Fr              | P         | Rge-Sha-Ste     | Gra         | 3             | Cha         |
|        | leptophyllum   | Cistaceae  | Koshein                | R         | I-II                 | H               | A         | Cul-Rge         | Gra         | 2             | Psa-Tac     |
|        | lippii         | Cistaceae  | Qadib el Raal          | CC        | I-III                | Fr              | P         | Rge-Snd-Ste     | Gra         | 3-4           | Psa         |
|        | salicifolium   | Cistaceae  | Koshein                | R         | I-II                 | H               | A         | Cul-Rge         | Gra         | 2             | Psa         |
|        | sessiliflorum  | Cistaceae  | Qadib el Raal          | FR        | I-II                 | Fr              | P         | Rge-Snd-Ste     | Gra         | 3-4           | Psa         |
|        | sphaerocalyx   | Cistaceae  | Koshein                | R         | I-II                 | Fr              | P         | Rge-Sha         | Gra         | 3             | Cha-End     |
|        | stipulaceum    | Cistaceae  | Koshein                | FC        | I-II                 | Fr              | P         | Rge-Sha         | Gra         | 2-3           | Cha         |
|        | vesticarium    | Cistaceae  | Koshein                | FC        | I-II                 | Fr              | P         | Rge-Sha-Ste     | Gra         | 2-3           | Cha         |
|        | ambryocarpa    | Cleomaceae | Zeita, Magruna         | CC        | I-III                | H               | A         | Cul-Ste-Wld     | Med         | T             | Psa-Wee     |
|        | gymandra       | Cleomaceae | Abu Qara, Abu Qarn     | R         | I-II                 | H               | A         | Wld             | Non         | 0             | Nat-Nit-Wee |
|        | fragrantissima | Compositae | Ge Soom                | RR        | III-VI               | H               | P         | Des-Wld         | Gra-Med     | 1             | Ere         |
|        | santolina      | Compositae | Bishreen, Chaihata     | R         | I-II                 | H               | P         | Cul-Wld         | Med         | 0             | Sil         |
|        | crupinoides    | Compositae | -                      | RR        | I-II                 | H               | A         | Cul-Wld         | Non         | 0             | Sil         |
|        | lippii         | Compositae | Kerzaran               | CC        | I-III                | H               | A         | Cul-Ste-Wld     | Non         | 0             | Sil         |
|        | maritima       | Compositae | Damaseisa              | R         | I                    | H               | B         | Coa-Snd         | Med         | 0             | Psa         |
|        | alexandrinus   | Compositae | Rigel Ghorab           | CC        | I-III                | H               | A         | Rge-Ste-Wld     | Gra         | 2             | Wee         |
|        | chia           | Compositae | Arbeyaan               | RR        | I-II                 | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
|        | incurvata      | Compositae | Arbejana               | R         | I-II                 | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
|        | melampodina    | Compositae | Firaakkomm Ali         | CC        | I-II                 | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
|        | microsperma    | Compositae | Arbeaan                | C         | I-II                 | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
|        | pseudo-cotula  | Compositae | Basoon, Iribayan       | CC        | I-II                 | H               | A         | Cul-Wld         | Med         | 0             | Wee         |
|        | garcini        | Compositae | Nogod                  | R         | III-VI               | Fr              | P         | Des-Wld         | Non         | 0             | Ere         |
|        | herba-alba     | Compositae | Sheeh                  | C         | I-III                | H               | P         | Rge-Ste         | Fsh-Gra-Med | 3             | Sil         |
|        | judicalia      | Compositae | Sheeb                  | FC        | III-VI               | H               | P         | Wad             | Gra-Med     | 1             | Ere         |
|        | monosperma     | Compositae | Aader                  | FC        | III-VI               | H               | P         | Des-Rge-Ste     | Gra         | 0             | Ere-Psa     |
|        | scoparia       | Compositae | -                      | RR        | I-II                 | Fr              | Sh        | Wld             | Non         | 0             | Wee         |
|        | quamatus       | Compositae | -                      | FC        | I-II                 | H               | B         | Wld             | Non         | 0             | Hal-Hyg-Sum |
|        | pygmaeus       | Compositae | Musmar el Ahd          | CC        | I-III                | H               | A         | Rge-Wld         | Non         | 0             | Ere-Sil     |
|        | spinosa        | Compositae | -                      | CC        | I-III                | H               | A         | Wld             | Non         | 0             | Nit         |
|        | cancellata     | Compositae | Akaash                 | FR        | I-II                 | H               | A         | Rge-Wld         | Non         | 0             | Wee         |
|        | carduus        | Compositae | -                      | CC        | I-III                | H               | P         | Rge-Wld         | Non         | 0             | Wee         |
|        | prolifera      | Compositae | -                      | CC        | I-III                | H               | A         | Cul-Rge-Ste     | Non         | 0             | Wee         |
|        | pilosaa        | Compositae | Sada                   | FC        | I-II                 | H               | A         | Wet-Wld         | Non         | 0             | Hyg-Wee     |
|        | avensis        | Compositae | AlOsafra, Ayn el Bagar | CC        | I-II                 | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
|        | eriocephalus   | Compositae | Kharshoof              | C         | I-II                 | H               | P         | Cul-Wad         | Non         | 0             | Ere         |
|        | mareoticus     | Compositae | Sarr                   | CC        | I-II                 | H               | P         | Cul-Sie-Wad-Wld | Non         | 0-1           | End-Sil-Wee |

| Genus                | Species                              | Vernacular name | Frequency              | Area of distribution | Biological type | Life span   | Habitat     | Utilization | Grazing value | Remarks |         |
|----------------------|--------------------------------------|-----------------|------------------------|----------------------|-----------------|-------------|-------------|-------------|---------------|---------|---------|
| <i>Carduus</i>       | <i>getulus</i>                       | Compositae      | Hotshot                | I-III                | A               | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Carduus</i>       | <i>pycnocephalus</i>                 | Compositae      | Lisananelkelb          | I-II                 | A               | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Cardina</i>       | <i>involucrata</i>                   | Compositae      | Moraar                 | CC                   | P               | Rge-Sts-Wld | Non         | 0           | Wee           |         |         |
| <i>Carthamus</i>     | <i>glaucus</i>                       | Compositae      | -                      | I-III                | H               | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Carthamus</i>     | <i>lanatus</i>                       | Compositae      | Shook Antar            | I-II                 | A               | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Carthamus</i>     | <i>tenius</i>                        | Compositae      | Qos                    | I-II                 | H               | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Centaurea</i>     | <i>aegialophila</i>                  | Compositae      | Akash                  | CC                   | P               | Coa-Snd     | Med         | 0           | Hal-Psa       |         |         |
| <i>Centaurea</i>     | <i>alexandrina</i>                   | Compositae      | Moraar                 | CC                   | A               | Cul-Wld     | Med         | 0           | Wee           |         |         |
| <i>Centaurea</i>     | <i>calcitrana</i>                    | Compositae      | Moraar, Sh,k           | CC                   | I-II            | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Centaurea</i>     | <i>dimorpha</i>                      | Compositae      | Moraar                 | C                    | P               | Cul-Ste-Wld | Non         | 0           | Psa           |         |         |
| <i>Centaurea</i>     | <i>turfuracea</i>                    | Compositae      | -                      | FC                   | A               | Cul-Rge-Sts | Non         | 0           | Psa           |         |         |
| <i>Centaurea</i>     | <i>glomerata</i>                     | Compositae      | Yamraar, Ardiaqn,      | C                    | I-II            | Cul-Wld     | Med         | 0           | Wee           |         |         |
| <i>Centaurea</i>     | <i>melitensis</i>                    | Compositae      | Moraar                 | FR                   | H               | Cul-Wld     | Non         | 0           | Sil           |         |         |
| <i>Centaurea</i>     | <i>pullata</i>                       | Compositae      | Moraar                 | C                    | B               | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Centaurea</i>     | <i>pumilio</i>                       | Compositae      | Moraar                 | FR                   | P               | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Centaurea</i>     | <i>soltisialis</i>                   | Compositae      | Moraar                 | RR                   | A               | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Ceratonia</i>     | <i>pratinoides</i>                   | Compositae      | Garaawan               | R                    | I-II            | Cul-Wld     | Non         | 0           | Wee           |         |         |
| <i>Chlamidophora</i> | <i>tridentata</i>                    | Compositae      | -                      | R                    | I-V             | A           | Rge-Sts     | Gra         | 2             | Ere     |         |
| <i>Chrysanthemum</i> | <i>coronarium</i>                    | Compositae      | Ophowan, Reza'a        | CC                   | I-II            | A           | Cul-Wld     | Med         | 0             | Wee     |         |
| <i>Cichorium</i>     | <i>endivia</i> subsp. <i>Pumilum</i> | Compositae      | Shikoria, Sires        | FC                   | I-II            | A-B         | Cul-Wld     | Gra-Med     | 2-3           | Pel-Sil |         |
| <i>Coryza</i>        | <i>bonariensis</i>                   | Compositae      | Hashishat el Gabal     | C                    | I-II            | A           | Cul-Wld     | Med         | 0             | Wee     |         |
| <i>Cotula</i>        | <i>anthemoides</i>                   | Compositae      | Rityaan                | C                    | I-II            | A           | Cul-Wet     | Med         | 0             | Hyg     |         |
| <i>Cotula</i>        | <i>cineraria</i>                     | Compositae      | Sakkaraan, Roboua,     | CC                   | III-IV          | P           | Des-Rge     | Gra-Med     | 1             | Ere     |         |
| <i>Crepis</i>        | <i>bulbosa</i>                       | Compositae      | -                      | FR                   | I               | P           | Snd-Wld     | Gra         | 1-2           | Psa     |         |
| <i>Crepis</i>        | <i>clausonis</i>                     | Compositae      | RR                     | I-II                 | H               | P           | Cul-Rge     | Gra         | 1             | Wee     |         |
| <i>Crepis</i>        | <i>lipyca</i>                        | Compositae      | R                      | I-II                 | H               | P           | Cul-Rge-Sts | Gra         | 2             | Tac-Wee |         |
| <i>Crepis</i>        | <i>micantha</i>                      | Compositae      | FC                     | I-II                 | H               | A           | Cul-Rge     | Gra         | 2             | Wee     |         |
| <i>Crepis</i>        | <i>crupinastrium</i>                 | Compositae      | -                      | RR                   | I-II            | A           | Cul         | Non         | 0             | Sil     |         |
| <i>Cynara</i>        | <i>cornigera</i>                     | Compositae      | Karschoof, Khorshef    | FC                   | I-II            | H           | P           | Cul-Rge-Wld | Med-Veg       | 0       | Pel-Wee |
| <i>Echinops</i>      | <i>galatensis</i>                    | Compositae      | Kasheer                | C                    | I-III           | H           | P           | Cul-Rge     | Non           | 0       | Wee     |
| <i>Echinops</i>      | <i>spiniosus</i>                     | Compositae      | Kaddad                 | CC                   | I-III           | H           | P           | Cul-Rge     | Med           | 0       | Wee     |
| <i>Echinops</i>      | <i>taekholmianus</i>                 | Compositae      | Kasheer, Sh,k el Gamel | CC                   | I-III           | H           | P           | Rge-Sha     | Med           | 0       | Wee     |
| <i>Echipta</i>       | <i>alba</i>                          | Compositae      | Korschof               | R                    | I-II            | H           | P           | Rge-Wld     | Non           | 0       | End     |
| <i>Ethulia</i>       | <i>conyzoides</i>                    | Compositae      | Sada, Suwwed           | R                    | I-II            | H           | A           | Wet-Wld     | Med           | 0       | Hyg-Wee |
| <i>Filago</i>        | <i>contracta</i>                     | Compositae      | Hashishel Faras        | C                    | I-II            | A           | Cul         | Non         | 0             | Wee     |         |
| <i>Filago</i>        | <i>desertorum</i>                    | Compositae      | -                      | FC                   | I-III           | H           | A           | Cul-Rge     | Non           | 2       | Wee     |
| <i>Filago</i>        | <i>mareotica</i>                     | Compositae      | -                      | CC                   | I-III           | H           | A           | Cul-Wld     | Non           | 0       | Sil-Tac |
| <i>Flaveria</i>      | <i>contrayerba</i>                   | Compositae      | Sada                   | R                    | I-II            | H           | Slt         | Non         | 0             | Hal     |         |
| <i>Garthadiolus</i>  | <i>angulosus</i>                     | Compositae      | -                      | CC                   | I-II            | H           | Wet-Wld     | Non         | 0             | Hyg-Sum |         |
|                      |                                      |                 |                        |                      |                 |             | Cul-Wld     | Gra         | 2             |         |         |

| Genus               | Species              | Family     | Vernacular name      | Frequency | Area of distribution | Biological type | Life span | Habitat     | Utilization | Grazing value | Remarks |
|---------------------|----------------------|------------|----------------------|-----------|----------------------|-----------------|-----------|-------------|-------------|---------------|---------|
| <i>Geopolygon</i>   |                      | Compositae | Thanal al Faras      | FC        | I-II                 | H               | B         | Cul         | Gra         | 2             | Wee     |
| <i>Gnaphalium</i>   | <i>hybridus</i>      | Compositae | —                    | R         | I-II                 | H               | A         | Wld         | Non         | 0             | Wee     |
| <i>Gnaphalium</i>   | <i>crispatum</i>     | Compositae | Saboon Afre et       | FC        | I-II                 | H               | A         | Wet         | Non         | 0             | Hyg     |
| <i>Gnaphalium</i>   | <i>luteo-album</i>   | Compositae | —                    | R         | I-II                 | H               | A         | Wld         | Non         | 0             | Wee     |
| <i>Gnaphalium</i>   | <i>polycaulon</i>    | Compositae | —                    | R         | I-II                 | H               | A         | Cul-Wld     | Non         | 0             | Wee     |
| <i>Gnangea</i>      | <i>maderaspatana</i> | Compositae | Kirsheff             | FR        | III-IV               | H               | A         | Rge-Sha-Ste | Non         | 0             | Cha-Tac |
| <i>Gymnarrhenia</i> | <i>micrantha</i>     | Compositae | —                    | CC        | I-II                 | H               | A         | Cul-Wld     | Gra         | 2             | Wee     |
| <i>Hedypnois</i>    | <i>rhaedoloides</i>  | Compositae | —                    | RR        | I-II                 | H               | P         | Cli-Snd     | Non         | 0             | Cha-Psa |
| <i>Heuchrysum</i>   | <i>conglobatum</i>   | Compositae | —                    | C         | I-II                 | H               | P         | Cli-Roc     | Non         | 0             | Cha     |
| <i>Heuchrysum</i>   | <i>orientale</i>     | Compositae | —                    | CC        | I-II                 | H               | A         | Cul-Wld     | Gra         | 2             | Wee     |
| <i>Hyoscyamus</i>   | <i>radiata</i>       | Compositae | —                    | RR        | I-II                 | H               | A         | Cul-Wld     | Gra         | 2             | Wee     |
| <i>Hyoscyamus</i>   | <i>scabra</i>        | Compositae | —                    | CC        | I-IV                 | H               | A         | Rge         | Gra         | 2             | Ere-Psa |
| <i>Iffoga</i>       | <i>labillardieri</i> | Compositae | Krayshif el Gadi     | CC        | I-IV                 | H               | A         | Rge-Ste     | Gra         | 0             | Ere-Psa |
| <i>Iffoga</i>       | <i>spicata</i>       | Compositae | Krayshif el Gadi     | CC        | I-IV                 | H               | P         | Coa-Roc     | Non         | 0             | Cha     |
| <i>Iffoga</i>       | <i>crithmoides</i>   | Compositae | Zetta                | C         | I                    | H               | P         | Wet-Wld     | Med         | 0             | Nit-Pel |
| <i>Inula</i>        | <i>viscosa</i>       | Compositae | Magramam             | R         | I-II                 | H               | A         | Rge-Snd-Ste | Gra         | 3             | Psa-Tac |
| <i>Koelpinia</i>    | <i>linearis</i>      | Compositae | —                    | C         | I-IV                 | H               | A-B       | Cul         | Med         | 0             | Wee     |
| <i>Lactuca</i>      | <i>saligna</i>       | Compositae | Hawa, Khass el Bagar | R         | I-II                 | H               | A-B       | Cul         | Med         | 0             | Nit-Wee |
| <i>Lastiopogon</i>  | <i>muscoides</i>     | Compositae | Kreishit el Gadge    | FR        | I-III                | H               | A         | Wld         | Non         | 0             | SO4     |
| <i>Lunaea</i>       | <i>angustifolia</i>  | Compositae | Noqod                | C         | III-IV               | H               | A-B       | Rge-Ste     | Gra         | 2             | Psa     |
| <i>Lunaea</i>       | <i>capitata</i>      | Compositae | Hoadaah              | CC        | III-IV               | H               | A         | Rge-Snd     | Gra         | 3             | Tac     |
| <i>Lunaea</i>       | <i>nudicaulis</i>    | Compositae | Howaa                | CC        | I-III                | H               | A         | Cul-Rge-Wld | Non         | 0             | Wee     |
| <i>Lunaea</i>       | <i>resedifolia</i>   | Compositae | —                    | FC        | I-III                | H               | A         | B-P-Sh      | Rge-Snd-Ste | 3-4           | Psa     |
| <i>Lunaea</i>       | <i>tenuiloba</i>     | Compositae | Silen                | FR        | III-IV               | H               | A-B       | Rge-Ste     | Gra         | 3             | Psa     |
| <i>Lentotodon</i>   | <i>hispidulus</i>    | Compositae | —                    | FC        | I-II                 | H               | A         | Cul-Wld     | Gra         | 2             | Wee     |
| <i>Lentotodon</i>   | <i>simplex</i>       | Compositae | Hawthan              | FR        | I-II                 | H               | A         | Cul-Wld     | Non         | 0             | Wee     |
| <i>Lentotodon</i>   | <i>tuberous</i>      | Compositae | Hawthan              | FR        | I-II                 | H               | P         | Cul-Wld     | Gra         | 2             | Wee     |
| <i>Mantisalca</i>   | <i>salmantica</i>    | Compositae | —                    | RR        | I-II                 | H               | A         | Cul-Wld     | Non         | 0             | Sil-Wee |
| <i>Maticaria</i>    | <i>aurea</i>         | Compositae | Qummeydi             | FR        | I-II                 | H               | A         | Wet         | Non         | 0             | Hyg     |
| <i>Maticaria</i>    | <i>recutita</i>      | Compositae | Baboonig             | R         | I-II                 | H               | A         | Wet         | Med-Veg     | 0             | Hyg-Nat |
| <i>Nauplius</i>     | <i>graveolens</i>    | Compositae | Rabd                 | FR        | III-VI               | H               | P         | Des-Wad     | Non         | 0             | Ere     |
| <i>Notobasis</i>    | <i>syriaca</i>       | Compositae | Kirsheff             | FR        | I-II                 | H               | A         | Cul-Wld     | Non         | 0             | Wee     |
| <i>Onopordum</i>    | <i>alexandrinum</i>  | Compositae | Shood el Hanash      | CC        | I-III                | H               | B         | Cul-Wld     | Non         | 0             | Psa     |
| <i>Omenis</i>       | <i>mixta</i>         | Compositae | —                    | RR        | I-II                 | H               | A         | Wet-Wld     | Non         | 0             | Hyg     |
| <i>Otanthus</i>     | <i>maritimus</i>     | Compositae | Shiba                | R         | I-II                 | H               | P         | Coa-Snd     | Med         | 0             | Hal     |
| <i>Phagnalon</i>    | <i>barbevatum</i>    | Compositae | Khanaanit            | R         | I-II                 | H               | P         | Cli         | Gra         | 1-2           | Cha     |
| <i>Phagnalon</i>    | <i>rupestre</i>      | Compositae | Taan el Arneb        | FC        | I-II                 | H               | P         | Cli-Ste     | Gra         | 1-2           | Cha     |
| <i>Picris</i>       | <i>asploides</i>     | Compositae | Halawaa              | CC        | I-II                 | H               | A         | Cul-Wld     | Gra         | 2             | Wee     |
| <i>Picris</i>       | <i>cyanocarpa</i>    | Compositae | —                    | RR        | I-II                 | H               | A         | Cul-Wld     | Gra         | 2             | Tac     |
| <i>Picris</i>       | <i>sprengeriiana</i> | Compositae | Moraar               | FC        | I-II                 | H               | A         | Cul-Wld     | Gra         | 1             | Wee     |
| <i>Ptilacea</i>     | <i>dioscoridis</i>   | Compositae | Barnf                | R         | I-II                 | H               | P         | Wld         | Non         | 0             | Wee     |

| Genus       | Species         | Family         | Vernacular name            | Frequency | Area of distribution | Biological type | Habitat | Life span    | Utilization | Grazing value | Remarks |
|-------------|-----------------|----------------|----------------------------|-----------|----------------------|-----------------|---------|--------------|-------------|---------------|---------|
| Pulicaria   |                 | Compositae     | Abou Ađn Safra             | FC        | I-II                 | H               | A       | Wet-Wld      | Non         | 0             | Hyg     |
| Pulicaria   | arabica         | Compositae     | Għobbeira, Aarfeg          | FR        | III-VI               | H               | P       | Des-Wld      | Med         | 0             | Ere     |
| Pulicaria   | crispia         | Compositae     | Morif                      | FR        | I-II                 | H               | P       | Cul-Rge      | Gra         | 3             | Sil     |
| Reichardia  | picroides       | Compositae     | Galween                    | FC        | I-III                | H               | P       | Cul-Rge-Site | Gra         | 3             | Sil     |
| Reichardia  | tingitana       | Compositae     | -                          | C         | I-II                 | H               | A       | Cul-Wld      | Gra         | 1-2           | Wee     |
| Rhagadiolus | stellatus       | Compositae     | A'arfej                    | R         | II-IV                | S               | P       | Rge          | Gra         | 3             | Psa     |
| Rhagadiolus | suaveolens      | Compositae     | -                          | FR        | I-II                 | H               | A-Sh    | Cul-Wld      | Non         | 0             | Wee     |
| Rhagadiolus | hispanicus      | Compositae     | Dabbah                     | CC        | I-III                | H               | P       | Rge-Ste      | Gra-Veg     | 3             | Wee     |
| Rhantrium   | undulata        | Compositae     | «Morar: Q,rries»           | CC        | I-II                 | H               | A       | Cul-Wld      | Non         | 0             | Wee     |
| Scolymus    | coronopifolius  | Compositae     | Morar                      | C         | I-II                 | H               | A       | Cul-Wld      | Non         | 0             | Wee     |
| Scorzonera  | glaucus         | Compositae     | Morar                      | C         | I-II                 | H               | A       | Cul-Wld      | Non         | 0             | Wee     |
| Senecio     | vulgaris        | Compositae     | Shook Simmari, Si el Gamej | FR        | I-II                 | H               | P       | Cul-Wld      | Med         | 0             | Nit     |
| Senecio     | mariannum       | Compositae     | -                          | FC        | I-II                 | H               | A       | Cul-Wld      | Non         | 0             | Wee     |
| Senecio     | asper           | Compositae     | -                          | R         | I-II                 | H               | A       | Cul-Wld      | Non         | 0             | Wee     |
| Senecio     | macrocarpus     | Compositae     | Go'odeid, Galawen          | CC        | I-II                 | H               | A       | Cul-Wld      | Non         | 0             | Wee     |
| Silvium     | oleraceus       | Compositae     | -                          | R         | I-II                 | H               | A       | Cul-Wld      | Non         | 0             | Wee     |
| Sonchus     | tenurimus       | Compositae     | -                          | R         | I-II                 | H               | A       | Cul-Wld      | Non         | 0             | Wee     |
| Sonchus     | suaveolens      | Compositae     | Haħadqaq                   | R         | I-II                 | H               | P       | Rge          | Non         | 0             | Wee     |
| Taraxacum   | minimum         | Compositae     | -                          | RR        | I-II                 | H               | P       | Cul-Wld      | Gra         | 2             | Wee     |
| Urospurum   | picrodes        | Compositae     | Galween, Salis             | FC        | I-II                 | H               | A       | Cul-Wld      | Gra         | 1-2           | Per-Wee |
| Vanthemis   | candidans       | Compositae     | -                          | FC        | I-II                 | H               | P       | Cul-Roc-Ste  | Med         | 0             | Cha-Pel |
| Sperianthus | spinosum        | Compositae     | Shobheit                   | FR        | I-II                 | H               | A       | Wld          | Non         | 0             | Wee     |
| Xanthium    | strumarium      | Compositae     | Karakħ el Bhar, Shabka     | R         | I-II                 | H               | A       | Wld          | Non         | 0             | Wee     |
| Xanthium    | silvatica       | Compositae     | -                          | RR        | I-II                 | Cl-H            | P       | Cul          | Non         | 0             | Wee     |
| Calystegia  | althaeoides     | Convolvulaceae | Maddah, Luuwaya            | CC        | I-II                 | Cl-H            | P       | Cul          | Med         | 0             | Psa-Wee |
| Convolvulus | arvensis        | Convolvulaceae | Ararayeh, Ullieg, Lebena   | CC        | I-II                 | H               | P       | Cul          | Gra         | 1             | Sil-Wee |
| Convolvulus | fatmensis       | Convolvulaceae | -                          | FR        | I-II                 | H               | A       | Rge-Wld      | Gra         | 1             | Sil     |
| Convolvulus | humilis         | Convolvulaceae | -                          | RR        | I-II                 | Cl-H            | A       | Cul          | Non         | 0             | Sil-Wee |
| Convolvulus | lanatus         | Convolvulaceae | Bayaad                     | CC        | I-II                 | Fr              | P       | Con-Snd      | Non         | 3-4           | Psa     |
| Convolvulus | lineatus        | Convolvulaceae | -                          | RR        | I-II                 | H               | P       | Cul          | Gra         | 2             | Wee     |
| Convolvulus | oleifolius      | Convolvulaceae | -                          | FR        | I-II                 | Fr              | P       | Cul-Run-Ste  | Non         | 3             | Cha     |
| Convolvulus | pilosellifolius | Convolvulaceae | -                          | FR        | I-II                 | H               | P       | Cul          | Gra         | 2             | Wee     |
| Convolvulus | siculus         | Convolvulaceae | -                          | FC        | I-II                 | Cl-H            | A       | Cul          | Non         | 0             | Sil-Wee |
| Convolvulus | stachydifolius  | Convolvulaceae | -                          | RR        | I-II                 | H               | P       | Rge          | Gra         | 2             | Psa     |
| Convolvulus | supinus         | Convolvulaceae | -                          | FR        | I-II                 | Cl-H            | P       | Cul          | Non         | 0             | Wee     |
| Convolvulus | tricolor        | Convolvulaceae | -                          | FR        | I-II                 | Cl-H            | P       | Cul          | Non         | 0             | Wee     |
| Cressa      | cretica         | Convolvulaceae | Molleih, Mellina           | CC        | I-II                 | H               | A       | Slt          | Non         | 0             | Hal     |
| Cuscuta     | campestris      | Convolvulaceae | -                          | RR        | I-II                 | Par             | P       | Cul-Rge      | Non         | 0             | Wee     |
| Cuscuta     | epithymum       | Convolvulaceae | -                          | FC        | I-II                 | Par             | P       | Cul-Rge      | Non         | 0             | Wee     |
| Cuscuta     | europea         | Convolvulaceae | -                          | C         | I-II                 | Par             | P       | Cul-Rge      | Non         | 0             | Wee     |
| Cuscuta     | palaestina      | Convolvulaceae | -                          | RR        | I-II                 | Par             | P       | Cul-Rge      | Non         | 0             | Wee     |

| Genus                 | Species               | Family         | Vernacular name        | Frequency | Area of distribution | Biological type | Life span | Habitat         | Utilization | Grazing value | Remarks     |
|-----------------------|-----------------------|----------------|------------------------|-----------|----------------------|-----------------|-----------|-----------------|-------------|---------------|-------------|
| <i>Cuscuta</i>        | <i>pedicellata</i>    | Convolvulaceae | Hamul                  | CC        | I-II                 | Par             | P         | Cul-Rge         | Non         | 0             | Wee         |
| <i>Cuscuta</i>        | <i>planiflora</i>     | Convolvulaceae | Hariret al Zaatar      | CC        | I-II                 | Par             | P         | Cul-Rge         | Med         | 0             | Wee         |
| <i>Iponmea</i>        | <i>caerulea</i>       | Convolvulaceae | —                      | FC        | I-II                 | Cl-H            | P         | Irr             | Non         | 0             | Sum         |
| <i>Iponmea</i>        | <i>imperati</i>       | Convolvulaceae | —                      | R         | I-II                 | Cl-H            | P         | Irr             | Non         | 0             | Sum         |
| <i>Crassula</i>       | <i>alata</i>          | Crassulaceae   | —                      | RR        | II-III               | Su              | A         | Wld             | Non         | 0             | Nit         |
| <i>Umbilicus</i>      | <i>horizontalis</i>   | Crassulaceae   | Widha                  | R         | I-II                 | Su              | A         | Rge             | Gra         | 0             | Nit         |
| <i>Alyssum</i>        | <i>desertorum</i>     | Cruciferae     | —                      | RR        | II-III               | H               | A         | Cul-Rge         | Gra         | 1-2           | Wee         |
| <i>Alyssum</i>        | <i>simplex</i>        | Cruciferae     | —                      | RR        | II-III               | H               | A         | Cul-Rge         | Gra         | 1-2           | Wee         |
| <i>Anastatica</i>     | <i>hierochuntica</i>  | Cruciferae     | Keff Maryam, Hidd M.   | CC        | III-VI               | H               | A         | Des-Ste         | Med         | 0             | Ere-Pel-Tac |
| <i>Biscutella</i>     | <i>depressa</i>       | Cruciferae     | —                      | RR        | I-II                 | H               | A         | Cul             | Non         | 0             | Wee         |
| <i>Biscutella</i>     | <i>didyma</i>         | Cruciferae     | Sofra                  | R         | I-II                 | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
| <i>Brassica</i>       | <i>nigra</i>          | Cruciferae     | Libsaan, Khardal Abiad | CC        | I-II                 | H               | A         | Med             | Med         | 0             | Wee         |
| <i>Brassica</i>       | <i>rapa</i>           | Cruciferae     | —                      | C         | I-II                 | H               | B         | Irr             | Non         | 0             | Wee         |
| <i>Brassica</i>       | <i>tournefortii</i>   | Cruciferae     | Shittam                | CC        | I-IV                 | H               | A         | Cul-Snd         | Non         | 0             | Psa-Wee     |
| <i>Brassica</i>       | <i>maritima</i>       | Cruciferae     | Fiq el Gamel           | CC        | I                    | CH              | A         | Coa-Snd         | Non         | 0             | Psa         |
| <i>Brassica</i>       | <i>hispida</i>        | Cruciferae     | —                      | RR        | I-II                 | H               | A         | Cul             | Non         | 0             | Wee         |
| <i>Brassica</i>       | <i>rumelica</i>       | Cruciferae     | —                      | RR        | I-II                 | H               | A         | Cul             | Non         | 0             | Wee         |
| <i>Brassica</i>       | <i>bursa-pastoris</i> | Cruciferae     | Kes el Ra0             | CC        | I-II                 | H               | A         | Wld             | Med         | 0             | Nit         |
| <i>Brassica</i>       | <i>annua</i>          | Cruciferae     | Qineybra               | CC        | I-III                | H               | A         | Cul-Rge-Ste-Wld | Non         | 0             | Sil-Wee     |
| <i>Brassicaria</i>    | <i>orientalis</i>     | Cruciferae     | —                      | RR        | II-III               | H               | A         | Cul             | Non         | 0             | Wee         |
| <i>Camelina</i>       | <i>squamatus</i>      | Cruciferae     | Rashad, Harra          | C         | I-II                 | H               | A-B       | Wet             | Non         | 0             | Hyg-Pel     |
| <i>Camelina</i>       | <i>sophia</i>         | Cruciferae     | —                      | RR        | I-II                 | H               | A         | Wld             | Non         | 0             | Wee         |
| <i>Camelina</i>       | <i>bipinnatus</i>     | Cruciferae     | —                      | C         | I-II                 | H               | A         | Cul-Rge         | Gra         | 1             | Wee         |
| <i>Corringia</i>      | <i>eruoides</i>       | Cruciferae     | —                      | R         | I-II                 | H               | A-B       | Cul-Wld         | Non         | 2             | Wee         |
| <i>Coronopus</i>      | <i>simplex</i>        | Cruciferae     | —                      | C         | I-II                 | H               | A         | Cul             | Non         | 0             | Wee         |
| <i>Descurainia</i>    | <i>viminaria</i>      | Cruciferae     | —                      | R         | I-II                 | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
| <i>Didesmus</i>       | <i>lyratus</i>        | Cruciferae     | Shittam                | CC        | I-II                 | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
| <i>Diplotaxis</i>     | <i>pierocarpus</i>    | Cruciferae     | —                      | R         | I-III                | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
| <i>Diplotaxis</i>     | <i>strangulatus</i>   | Cruciferae     | Cruciferae             | C         | I-I                  | H               | A         | Cul-Wld         | Non         | 0             | Wee         |
| <i>Diplotaxis</i>     | <i>aegyptiacum</i>    | Cruciferae     | Dakhayaan              | CC        | I-III                | H               | A         | Snd-Ste         | Gra         | 1             | Psa         |
| <i>Enarthrocarpus</i> | <i>sativa</i>         | Cruciferae     | Gegeer, Gargir         | R         | I-III                | H               | A         | Cul-Ste-Wld     | Gra-Med     | 2-3           | Wee         |
| <i>Enarthrocarpus</i> | <i>crassifolia</i>    | Cruciferae     | Kromb sahra            | R         | III-VI               | H               | A         | Rge             | Gra         | 2             | S04         |
| <i>Enarthrocarpus</i> | <i>hispanica</i>      | Cruciferae     | Rawq                   | C         | I-II                 | H               | A         | Cul             | Non         | 0             | Wee         |
| <i>Eruca</i>          | <i>microcarpa</i>     | Cruciferae     | —                      | R         | I-III                | H               | A         | Cul-Rge         | Gra         | 1             | Wee         |
| <i>Eruca</i>          | <i>pinnata</i>        | Cruciferae     | Saleek                 | C         | I-IV                 | H               | A         | Cul-Rge         | Gra         | 1             | Wee         |
| <i>Eruca</i>          | <i>repandum</i>       | Cruciferae     | —                      | RR        | I-II                 | H               | A         | Cul-Rge         | Non         | 0             | Wee         |
| <i>Erysimum</i>       | <i>aegyptiacum</i>    | Cruciferae     | Gaba                   | CC        | II-VI                | H               | P-Sh      | Rge             | Gra         | 1-2           | Ere         |
| <i>Farsetia</i>       | <i>longisiliqua</i>   | Cruciferae     | Hook                   | R         | II-VI                | H               | P         | Rge             | Gra         | 1-2           | Ere         |
| <i>Farsetia</i>       | <i>lusitanica</i>     | Cruciferae     | Sofiera                | R         | I-II                 | H               | A         | Cul             | Non         | 0             | Wee         |
| <i>Isatis</i>         | <i>microcarpa</i>     | Cruciferae     | —                      | R         | I-II                 | H               | A         | Cul             | Non         | 0             | Wee         |

| Genus         | Species                  | Family         | Vernacular name        | Frequency | Area of distribution | Biological type | Life span | Habitat    | Utilization | Grazing value | Remarks |
|---------------|--------------------------|----------------|------------------------|-----------|----------------------|-----------------|-----------|------------|-------------|---------------|---------|
| Lepidium      | aucherii                 | Cruciferae     | —                      | RR        | I-II                 | H               | A         | Cul-Wld    | Non         | 0             | End-Wee |
| Lepidium      | draba                    | Cruciferae     | —                      | R         | I-II                 | H               | A         | Cul-Wld    | Non         | 0             | Wee     |
| Lepidium      | latifolium               | Cruciferae     | Rashad                 | R         | I-II                 | H               | P         | Cul-Wld    | Non         | 0             | Wee     |
| Lobularia     | arabica                  | Cruciferae     | Dalayaan               | C         | I-III                | H               | A         | Cul-Snd    | Non         | 0             | Psa     |
| Lobularia     | libyca                   | Cruciferae     | Khorn el libra         | C         | I-III                | H               | A         | Cul-Snd    | Gra         | 1             | Psa     |
| Lobularia     | maritima                 | Cruciferae     | Aguerma                | FR        | —                    | H               | A         | Coa-Dne    | Med         | 0             | Psa     |
| Malcolmia     | nana                     | Cruciferae     | —                      | RR        | I-II                 | H               | A         | Rge        | Gra         | 2-3           | Psa     |
| Malcolmia     | pygmaea                  | Cruciferae     | Shigara                | R         | I-II                 | H               | A         | Rge-Wld    | Gra         | 2-3           | Psa     |
| Malcolmia     | bicornis                 | Cruciferae     | —                      | RR        | I-III                | H               | A         | Cul        | Gra         | 2             | Psa     |
| Malcolmia     | fruticulosa              | Cruciferae     | Mantoor                | RR        | I-II                 | H               | P         | Sha-Snd-St | Gra         | 3             | Psa     |
| Malcolmia     | livida                   | Cruciferae     | Shigara                | CC        | III-VI               | H               | A         | Des        | Gra         | 2             | Ere     |
| Malcolmia     | longipetala              | Cruciferae     | —                      | CC        | I-III                | H               | A         | Cul-Rge-St | Gra         | 2             | Psa     |
| Matthiola     | pumilio                  | Cruciferae     | —                      | CC        | I-II                 | H               | A         | Cul        | Gra         | 2             | Psa     |
| Matthiola     | nitens                   | Cruciferae     | H'mim                  | FC        | I-II                 | F               | P         | Cul-Rge    | Fish-Gra    | 3-4           | Sil-S04 |
| Matthiola     | coronopifolia            | Cruciferae     | —                      | R         | I-III                | H               | A         | Rge-Wld    | Med         | 0             | Sil-S04 |
| Matthiola     | officinale               | Cruciferae     | Qurrat el Ayn          | C         | I-II                 | H               | P         | Can-Fw     | Med-Veg     | 2-3           | Hyd     |
| Matthiola     | torulosa                 | Cruciferae     | —                      | R         | I-II                 | H               | A         | Rge-Wld    | Non         | 0             | Wee     |
| Moricandia    | aegyptiacum              | Cruciferae     | —                      | R         | I-II                 | H               | A         | Cul        | Non         | 0             | Wee     |
| Nasturtiumpis | clavata                  | Cruciferae     | —                      | R         | I-III                | CH              | A         | Rge-St     | Gra         | 2             | S04     |
| Nasturtium    | raphanistrum             | Cruciferae     | —                      | CC        | I-II                 | H               | A         | Irr        | Non         | 0             | Wee     |
| Neotorularia  | rugosum                  | Cruciferae     | —                      | CC        | I-II                 | H               | A         | Cul-Wld    | Non         | 0             | Wee     |
| Ochthodium    | palustris                | Cruciferae     | —                      | C         | I-II                 | H               | A         | Can-Fw     | Non         | 0             | Hyg     |
| Pseuderucaria | thebaica                 | Cruciferae     | Mahad                  | R         | I-II                 | H               | A         | Des-Wld    | Gra         | 3             | Ere     |
| Raphanus      | alba                     | Cruciferae     | Khardal                | R         | I-II                 | H               | A         | Irr        | Med         | 0             | Wee     |
| Rapistrum     | arvensis                 | Cruciferae     | Khardal                | CC        | I-II                 | H               | A         | A-Sh       | Can-Fw      | Non           | Wee     |
| Rorippa       | pubescens                | Cruciferae     | Khardal                | C         | I-II                 | H               | A         | Cul        | Med         | 0             | Wee     |
| Schouwia      | irio                     | Cruciferae     | Shillyat, Fig el Ganat | CC        | I-II                 | H               | A         | Cul-Wld    | Non         | 0             | Wee     |
| Sinapis       | spinosa subsp. bipinnata | Cruciferae     | Zilla, Shebrom         | C         | II-V                 | DS              | P         | Des-Wld    | Gra-Med     | 3             | End-Ere |
| Sinapis       | cretica                  | Cucurbitaceae  | Tafwa, Fashira         | R         | I-II                 | CI              | P         | Cul-Snd    | Med         | 0             | Psa     |
| Sinapis       | cologyna                 | Cucurbitaceae  | Handal                 | CC        | I-V                  | CI              | P         | Rge-Snd-St | Med         | 0             | Psa     |
| Sinapis       | phoenicea                | Cupressaceae   | A'arar                 | R         | I-II                 | HS-T            | P         | Roc        | Fle-Gra-Med | 1             | ForE    |
| Sisymbrium    | nodosa                   | Cymodoceaceae  | Qeshr                  | C         | I                    | H               | P         | Sea        | Non         | 0             | Hyd     |
| Zilla         | coccineum                | Cynorrhizaceae | Zab et Ard             | FC        | I-III                | Par             | P         | Slt        | Med         | 0             | Hal     |
| Bryonia       | divisa                   | Cyperaceae     | Sard                   | C         | I-II                 | H               | P         | Cul-Wet    | Non         | 0             | Hyg     |
| Citellus      | extensa                  | Cyperaceae     | —                      | R         | I-II                 | H               | P         | Cul-Wet    | Non         | 0             | Hyg     |
| Juniperus     | alopecuroides            | Cyperaceae     | Koosh, Samar           | CC        | I-II                 | H               | P         | Wet        | Non         | 0             | Hyg     |
| Cynodocea     | capitatus                | Cyperaceae     | S'eed                  | C         | I-II                 | H               | P         | Wet        | Non         | 0             | Hyg     |
| Carex         | conglomeratus            | Cyperaceae     | Ostib                  | C         | I-V                  | H               | P         | Des-Snd    | Gra         | 3             | Ere-Psa |
| Carex         | difformis                | Cyperaceae     | Agerra                 | C         | I-II                 | H               | A         | Wet        | Non         | 0             | Hyg     |
| Cyperus       | digitatus                | Cyperaceae     | Qorreih                | C         | I-II                 | H               | P         | Wet        | Non         | 0             | Hyg     |

| Genus          | Species        | Family        | Vernacular name    | Frequency | Area of distribution | Biological type | Life span | Habitat     | Utilization | Grazing value | Remarks |
|----------------|----------------|---------------|--------------------|-----------|----------------------|-----------------|-----------|-------------|-------------|---------------|---------|
| Cyperus        | esculentus     | Cyperaceae    | Habib el Azeez     | R         | I-II                 | H               | P         | Irr-Wet     | Med-1 veg   | 0             | Hyg     |
| Cyperus        | fuscus         | Cyperaceae    | S'ed               | R         | I-II                 | H               | P         | Wet         | Non         | 0             | Hyg     |
| Cyperus        | laevigatus     | Cyperaceae    | Dees, S'ed, Burbet | CC        | I-II                 | H               | P         | Wet         | Non         | 0             | Hyg     |
| Cyperus        | rotundus       | Cyperaceae    | S'ed el Hommar     | CC        | I-II                 | H               | P         | Irr-Wet     | Med         | 0             | Hyg     |
| Cyperus        | schimperiarius | Cyperaceae    | S'ed               | R         | I-II                 | H               | P         | Wet         | Non         | 0             | Hyg     |
| Cyperus        | geniculata     | Cyperaceae    | -                  | R         | I-II                 | H               | A-Sh      | Wet         | Non         | 0             | Hyg     |
| Eleocharis     | palustris      | Cyperaceae    | -                  | C         | I-II                 | H               | P         | Wet         | Non         | 0             | Hyg     |
| Eleocharis     | parvula        | Cyperaceae    | -                  | RR        | I-II                 | H               | P         | Wet         | Non         | 0             | Hyg     |
| Fimbristylis   | bisumbellata   | Cyperaceae    | Forysh, Shaara     | CC        | I-II                 | H               | A         | Wet         | Non         | 0             | Hyg     |
| Fimbristylis   | pubescens      | Cyperaceae    | Shaara             | R         | I-II                 | H               | P         | Wet         | Non         | 0             | Hyg     |
| Schoenus       | nigricans      | Cyperaceae    | -                  | R         | I-II                 | H               | P         | Sit-Wet     | Non         | 0             | Hal-Hyg |
| Scirpus        | articulatus    | Cyperaceae    | Smaar              | RR        | I-II                 | H               | A         | Wet         | Non         | 0             | Hyg     |
| Scirpus        | holoschenus    | Cyperaceae    | Dees               | R         | I-II                 | H               | P         | Sit-Wet     | Non         | 0             | Hal-Hyg |
| Scirpus        | inclinatus     | Cyperaceae    | Samaar             | R         | I-II                 | H               | P         | Wet         | Non         | 0             | Hyg     |
| Scirpus        | litoralis      | Cyperaceae    | Khabb              | CC        | I-II                 | H               | P         | Wet         | Non         | 0             | Hyg     |
| Scirpus        | maritimus      | Cyperaceae    | Smaar              | CC        | I-II                 | H               | P         | Sit-Wet     | Non         | 0             | Hal-Hyg |
| Scirpus        | praerogonus    | Cyperaceae    | Dees               | C         | I-II                 | H               | P         | Wet         | Non         | 0             | Hyg     |
| Scirpus        | supinus        | Cyperaceae    | Khabb              | R         | I-II                 | H               | A         | Wet         | Non         | 0             | Hyg     |
| Scirpus        | syriaca        | Dipsacaceae   | Siwaan             | R         | I-II                 | H               | A         | Rge-Wild    | Gra         | 1             | Wee     |
| Cephalaria     | plumosus       | Dipsacaceae   | Soferra            | FR        | I-III                | H               | A         | Rge         | Gra         | 1             | Tac-Wee |
| Pteroecephalus | eremophilii    | Dipsacaceae   | Kaheil Ghazal      | R         | I-III                | H               | A         | Rge         | Gra         | 1             | Wee     |
| Scabiosa       | rhizantha      | Dipsacaceae   | Siwaan             | R         | I-II                 | H               | A         | Rge         | Gra         | 1             | Wee     |
| Scabiosa       | alata          | Ephedraceae   | Ald, Alendra       | R         | III-V                | HS              | P         | Des-Snd     | Gra-Med     | 1-2           | Ere     |
| Ephedra        | aphylla        | Ephedraceae   | Alqam, Naad        | FC        | I-II                 | HS              | P         | Cli-Run-Wad | Gra-Med     | 3             | Cha     |
| Ephedra        | trinctoria     | Euphorbiaceae | Ghobbeira          | FC        | I-III                | H               | A         | Wild        | Non         | T             | Sum     |
| Chrozophora    | arguta         | Euphorbiaceae | Libein             | C         | I-III                | H               | A         | Rge-Wild    | Non         | T             | Wee     |
| Euphorbia      | bivonae        | Euphorbiaceae | Libein             | R         | I-II                 | S               | P         | Roc         | Non         | T             | Cha     |
| Euphorbia      | bivonae        | Euphorbiaceae | Libein             | FR        | I-II                 | DS              | P         | Cli         | Non         | T             | Cha     |
| Euphorbia      | chamaepeplus   | Euphorbiaceae | Bena               | RR        | I-II                 | H               | A         | Cul-Wild    | Non         | T             | Wee     |
| Euphorbia      | dendroides     | Euphorbiaceae | Libein             | R         | I-II                 | DS              | P         | Cli-Roc     | Non         | T             | Cha     |
| Euphorbia      | falcata        | Euphorbiaceae | Libein             | RR        | I-II                 | H               | A         | Cul-Wild    | Non         | T             | Wee     |
| Euphorbia      | forskallii     | Euphorbiaceae | Shareef Agouz      | C         | I-II                 | H               | A         | Cul-Wild    | Non         | T             | Wee     |
| Euphorbia      | helioscopia    | Euphorbiaceae | Libein, Saada      | C         | I-II                 | H               | A         | Cul-Wild    | Med         | T             | Nit-Wee |
| Euphorbia      | hirta          | Euphorbiaceae | Libein             | C         | I-II                 | H               | A         | Wild        | Non         | T             | Wee     |
| Euphorbia      | mauritanica    | Euphorbiaceae | Libein             | R         | I-II                 | H               | P         | Wild        | Non         | T             | Wee     |
| Euphorbia      | paralias       | Euphorbiaceae | Shagaret el Hanash | C         | I                    | Fr              | P         | Coa-Snd     | Non         | T             | Psa     |
| Euphorbia      | parvula        | Euphorbiaceae | Libein             | RR        | I-II                 | H               | A         | Wild        | Non         | T             | Wee     |
| Euphorbia      | peplis         | Euphorbiaceae | Libein             | R         | I-II                 | H               | A         | Cul-Wild    | Non         | T             | Wee     |
| Euphorbia      | peplus         | Euphorbiaceae | Widenia            | CC        | I-II                 | H               | A         | Cul-Wild    | Med         | T             | Wee     |
| Euphorbia      | prostrata      | Euphorbiaceae | Libein             | C         | I-II                 | H               | A         | Cul-Wild    | Non         | T             | Wee     |

| Genus       | Species        | Family        | Vernacular name     | Frequency | Area of distribution | Biological type | Habitat     | Life span   | Utilization | Grazing value | Remarks |
|-------------|----------------|---------------|---------------------|-----------|----------------------|-----------------|-------------|-------------|-------------|---------------|---------|
| Euphorbia   | pterococca     | Euphorbiaceae | Libbein             | RR        | I-II                 | A               | Cul-Wld     | Non         | T           | Wee           |         |
| Euphorbia   | punctata       | Euphorbiaceae | Libbein             | RR        | I-II                 | A               | Cul-Wld     | Non         | T           | Wee           |         |
| Euphorbia   | retusa         | Euphorbiaceae | No'manya            | C         | III-VI               | P               | Des-Rge-Ste | Non         | T           | Ere           |         |
| Euphorbia   | terracina      | Euphorbiaceae | Libbein             | C         | I-III                | P               | Cul-Ste-Wld | Non         | T           | Wee           |         |
| Euphorbia   | tuberculatum   | Euphorbiaceae | Shag, el Kalb, F-el | CC        | I-III                | P               | Cul-Wld     | Med         | T           | Sum           |         |
| Halophyllum | annua          | Euphorbiaceae | Halbop              | R         | I-II                 | A-B             | Ori-Run-Wld | Med         | T           | Nit           |         |
| Mercurialis | rotundifolius  | Euphorbiaceae | Tarantoi hindi      | FC        | I-II                 | A               | Cul-Wld     | Non         | 0           | Wee           |         |
| Phyllanthus | communis       | Euphorbiaceae | Kretoua, Kherwa     | FR        | I-II                 | TS              | P           | Snd-Wad-Wld | T           | Nat-Psa       |         |
| Ricinus     | hirsuta        | Frankeniacae  | Molleih             | R         | I-IV                 | P               | Slt         | Non         | 0           | Hal           |         |
| Frankenia   | pulverulenta   | Frankeniacae  | Molleih             | C         | I-IV                 | A               | Slt         | Non         | 0           | Hal           |         |
| Frankenia   | revoluta       | Frankeniacae  | -                   | RR        | III-VI               | P               | Slt         | Non         | 0           | Hal           |         |
| Fumaria     | bracteosa      | Fumariaceae   | Zaita               | RR        | I-II                 | H               | Cul         | Non         | 0           | Wee           |         |
| Fumaria     | capreolata     | Fumariaceae   | -                   | RR        | I-II                 | H               | Cul         | Non         | 0           | Wee           |         |
| Fumaria     | densiflora     | Fumariaceae   | -                   | RR        | I-II                 | H               | Cul         | Non         | 0           | Wee           |         |
| Fumaria     | gaillardotii   | Fumariaceae   | -                   | RR        | I-II                 | H               | Cul         | Non         | 0           | Wee           |         |
| Fumaria     | judaica        | Fumariaceae   | -                   | RR        | I-II                 | H               | Cul         | Med         | 0           | Wee           |         |
| Fumaria     | microstachys   | Fumariaceae   | -                   | RR        | I-II                 | H               | Cul         | Non         | 0           | Wee           |         |
| Fumaria     | officialis     | Fumariaceae   | -                   | RR        | I-II                 | H               | Cul         | Med         | 0           | Wee           |         |
| Fumaria     | parviflora     | Fumariaceae   | -                   | RR        | I-II                 | H               | Cul         | Med         | 0           | Wee           |         |
| Fumaria     | aegyptiacum    | Fumariaceae   | -                   | RR        | I-II                 | H               | Cul         | Des-Rge     | 0           | Psa-Tac       |         |
| Hypecoum    | aequibulum     | Hypecoum      | -                   | R         | I-III                | H               | Cul         | Non         | 0           | Psa-Tac       |         |
| Hypecoum    | littorale      | Hypecoum      | -                   | RR        | I                    | H               | Cul         | Coa-Snd     | 0           | Psa           |         |
| Hypecoum    | pendulum       | Hypecoum      | -                   | RR        | I-III                | H               | Cul         | Des-Rge     | 0           | Psa-Tac       |         |
| Hypecoum    | procumbens     | Hypecoum      | -                   | RR        | I-II                 | H               | Cul         | Coa-Snd     | 0           | Psa-Tac       |         |
| Centaurium  | maritimum      | Genitanaceae  | -                   | RR        | I-III                | H               | Cul         | Des-Rge     | 0           | Psa-Tac       |         |
| Centaurium  | pulchellum     | Genitanaceae  | -                   | RR        | I-III                | H               | Cul         | Coa-Snd     | 0           | Psa-Tac       |         |
| Centaurium  | spicatum       | Genitanaceae  | -                   | RR        | I-III                | H               | Cul         | Des-Rge     | 0           | Psa-Tac       |         |
| Erodium     | arborescens    | Geraniaceae   | Menash el Dibban    | C         | I-II                 | H               | Cul         | Non         | 0           | Psa-Tac       |         |
| Erodium     | chiuum         | Geraniaceae   | Dama                | R         | I-III                | CH              | P           | Rge-Ste-Wld | 0           | Psa           |         |
| Erodium     | ciconium       | Geraniaceae   | Ghazian             | R         | I-II                 | H               | Cul         | Rge         | 2           | Wee           |         |
| Erodium     | cicutarium     | Geraniaceae   | Abu Mosta           | R         | I-II                 | H               | Cul         | Rge         | 2           | Wee           |         |
| Erodium     | crassifolium   | Geraniaceae   | Dahmeya abu Ghazal  | FC        | I-II                 | H               | Cul         | Rge         | 2           | Wee           |         |
| Erodium     | glaucocephalum | Geraniaceae   | -                   | C         | I-II                 | H               | P           | Rge-Ste-Wld | 1           | Nit           |         |
| Erodium     | gruinum        | Geraniaceae   | Timmeir             | CC        | I-III                | CH              | P           | Rge-Ste-Wld | 0           | Sil-SO4       |         |
| Erodium     | laciniatum     | Geraniaceae   | Abu Mosta           | R         | I-II                 | H               | Cul         | Rge         | 2           | Wee           |         |
| Erodium     | malacoides     | Geraniaceae   | Molyhal             | CC        | I-II                 | H               | Cul         | Rge         | 2-3         | Psa           |         |
| Erodium     | moschatum      | Geraniaceae   | Oqeil               | R         | I-II                 | H               | Cul         | Rge         | 2           | Wee           |         |
| Erodium     | neuradifolium  | Geraniaceae   | Meseika             | R         | I-II                 | H               | Cul         | Rge         | 2-3         | Psa           |         |
| Erodium     | oxyrhynchum    | Geraniaceae   | -                   | C         | I-II                 | H               | P           | Cul-Rge-Ste | 1           | Wee           |         |
| Geranium    | dissectum      | Geraniaceae   | -                   | R         | I-II                 | H               | Cul         | Non         | 0           | Wee           |         |

| Genus               | Species              | Family         | Vernacular name      | Frequency | Area of distribution | Biological type | Habitat | Life span   | Utilization | Grazing value | Remarks     |
|---------------------|----------------------|----------------|----------------------|-----------|----------------------|-----------------|---------|-------------|-------------|---------------|-------------|
| <i>Geranium</i>     | <i>molle</i>         | Geraniaceae    | -                    | RR        | I-II                 | H               | A       | Cul         | Non         | 0             | Wee         |
| <i>Globularia</i>   | <i>alypum</i>        | Globulariaceae | Ztega                | FR        | I-II                 | H               | P       | Cli-Roc-Ste | Gra-Med     | 2             | Cha         |
| <i>Globularia</i>   | <i>arabica</i>       | Globulariaceae | Ztega                | FC        | I-II                 | H               | P       | Cli-Roc-Ste | Gra-Med     | 2             | Cha         |
| <i>Globularia</i>   | <i>bicornis</i>      | Gramineae      | Shaer el Ides        | CC        | I-II                 | H               | A       | Cul-Rge-Wld | Gra         | 1             | Wee         |
| <i>Aegylops</i>     | <i>geniculata</i>    | Gramineae      | Gramineae            | FR        | I-II                 | H               | A       | Cul-Rge-Wld | Gra         | 1             | Wee         |
| <i>Aegylops</i>     | <i>kotschy</i>       | Gramineae      | Shaer el Fahr        | C         | I-II                 | H               | A       | Cul-Rge-Wld | Gra         | 1             | Wee         |
| <i>Aegylops</i>     | <i>longissima</i>    | Gramineae      | -                    | R         | I-II                 | H               | A       | Cul-Rge-Wld | Gra         | 1             | Wee         |
| <i>Aegylops</i>     | <i>peregrina</i>     | Gramineae      | -                    | RR        | I-II                 | H               | A       | Cul-Rge-Wld | Gra         | 1             | Wee         |
| <i>Aegylops</i>     | <i>ventricosa</i>    | Gramineae      | Shaer el Fahr        | RR        | I-II                 | H               | A       | Cul-Rge-Wld | Gra         | 2             | Wee         |
| <i>Aegylops</i>     | <i>lagopoides</i>    | Gramineae      | Akreeesh             | CC        | I-II                 | H               | P       | Slt         | Gra         | 1             | Hal         |
| <i>Aelropus</i>     | <i>cristatum</i>     | Gramineae      | -                    | R         | I-II                 | H               | P       | Cul         | Gra         | 3             | Wee         |
| <i>Agropyron</i>    | <i>myosuroides</i>   | Gramineae      | -                    | R         | I-II                 | H               | P       | Wet         | Gra         | 2             | Hyg         |
| <i>Alpecurus</i>    | <i>palaestina</i>    | Gramineae      | -                    | FC        | I-II                 | H               | A       | Cul-Rge     | Non         | 0             | Hal         |
| <i>Ammodochia</i>   | <i>arenaria</i>      | Gramineae      | Gazzoot              | CC        | I-II                 | H               | P       | Coa-Snd     | Non         | 0             | Hal-Psa     |
| <i>Ammophila</i>    | <i>funiculata</i>    | Gramineae      | Qaw                  | R         | I-II                 | H               | A       | Rge-Snd     | Gra         | 2             | Psa         |
| <i>Aristida</i>     | <i>donax</i>         | Gramineae      | Ghab, B <sub>s</sub> | CC        | I-II                 | H               | P       | Wet         | Han-Wor     | 2             | Hyg         |
| <i>Arundo</i>       | <i>barbata</i>       | Gramineae      | Khatfor              | CC        | I-II                 | H               | A       | Cul-Wld     | Gra         | 2             | Wee         |
| <i>Avena</i>        | <i>fatua</i>         | Gramineae      | Khatfor, Zummayr     | FC        | I-II                 | H               | A       | Cul-Wld     | Gra         | 2             | Wee         |
| <i>Avena</i>        | <i>sterilis</i>      | Gramineae      | Khatfor              | FC        | I-II                 | H               | A       | Cul-Wld     | Gra         | 2             | Wee         |
| <i>Avena</i>        | <i>mutica</i>        | Gramineae      | Moddeid              | R         | I-II                 | H               | P       | Irr         | Gra         | 5             | Fod-Hyg-Sum |
| <i>Bracharia</i>    | <i>reptans</i>       | Gramineae      | Nisella              | R         | I-II                 | H               | P       | Wet         | Gra         | 2-3           | Hyg-Sum     |
| <i>Brachypodium</i> | <i>distachyum</i>    | Gramineae      | Shaer Barri          | CC        | I-II                 | H               | A       | Rge-Ste-Wld | Non         | 1             | Wee         |
| <i>Briza</i>        | <i>maxima</i>        | Gramineae      | Sahlah               | R         | I-II                 | H               | A       | Rge-Ste-Wld | Gra         | 1-2           | Wee         |
| <i>Briza</i>        | <i>minor</i>         | Gramineae      | Sahlah               | RR        | I-II                 | H               | A       | Wld         | Gra         | 1-2           | Wee         |
| <i>Bromus</i>       | <i>aegyptiacus</i>   | Gramineae      | Khatfor              | -         | I-II                 | H               | A       | Cul-Wld     | Gra         | 2             | Wee         |
| <i>Bromus</i>       | <i>diandrus</i>      | Gramineae      | Saf Soof             | R         | I-II                 | H               | A       | Cul-Wld     | Gra         | 2             | Wee         |
| <i>Bromus</i>       | <i>fasciculatus</i>  | Gramineae      | -                    | CC        | I-II                 | H               | A       | Cul-Rge-Wld | Gra         | 2             | Wee         |
| <i>Bromus</i>       | <i>japonicus</i>     | Gramineae      | Saf Soof             | RR        | I-II                 | H               | A       | Cul-Wld     | Gra         | 2             | Wee         |
| <i>Bromus</i>       | <i>madritensis</i>   | Gramineae      | -                    | R         | I-II                 | H               | A       | Cul-Wld     | Gra         | 2             | Wee         |
| <i>Bromus</i>       | <i>rubens</i>        | Gramineae      | -                    | C         | I-II                 | H               | A       | Cul-Rge-Wld | Gra         | 2             | Wee         |
| <i>Bromus</i>       | <i>scoparius</i>     | Gramineae      | Sabal el Fahr        | C         | I-II                 | H               | A       | Cul-Wld     | Gra         | 2             | Wee         |
| <i>Bromus</i>       | <i>tectorum</i>      | Gramineae      | Sabal abu Hossein    | R         | I-II                 | H               | A       | Cul-Wld     | Gra         | 2             | Wee         |
| <i>Castellia</i>    | <i>tuberculata</i>   | Gramineae      | -                    | RR        | I-II                 | H               | A       | Rge         | Gra         | 2             | Psa         |
| <i>Catapodium</i>   | <i>rigidum</i>       | Gramineae      | -                    | RR        | I-II                 | H               | A       | Cul-Wld     | Gra         | 1             | Psa         |
| <i>Cerchthrus</i>   | <i>ciliaris</i>      | Gramineae      | Hada                 | RR        | I-II                 | H               | P       | Cul-Run     | Gra         | 5             | Fod-Psa     |
| <i>Centropodia</i>  | <i>forskallii</i>    | Gramineae      | Migel en Naga        | FR        | I-II                 | H               | P       | Rge-Snd     | Gra         | 2             | Ere-Psa     |
| <i>Conyephorus</i>  | <i>divaricatus</i>   | Gramineae      | -                    | FR        | I-II                 | H               | A       | Coa-Snd     | Non         | 0             | Psa         |
| <i>Critchopsis</i>  | <i>delileana</i>     | Gramineae      | -                    | RR        | I-II                 | H               | A       | Rge-Ste-Wld | Gra         | 1             | Wee         |
| <i>Crypsis</i>      | <i>aculeata</i>      | Gramineae      | -                    | R         | I-II                 | H               | A       | Wet         | Non         | 0             | Hyg         |
| <i>Crypsis</i>      | <i>alopecuroides</i> | Gramineae      | -                    | R         | I-II                 | H               | A       | Wet         | Non         | 0             | Hyg         |

| Genus          | Species     | Family    | Vernacular name           | Frequency | Area of distribution | Biological type | Habitat | Utilization     | Grazing value | Remarks     |
|----------------|-------------|-----------|---------------------------|-----------|----------------------|-----------------|---------|-----------------|---------------|-------------|
| Crypsis        | schoenoides | Gramineae | -                         | R         | I-II                 | H               | A       | Wet             | 0             | Hyg         |
| Cutandia       | dictyotoma  | Gramineae | Sammah                    | CC        | I-III                | H               | A       | Con-Snd-Ste     | 2             | Psa-Tac     |
| Cutandia       | maritima    | Gramineae | Sammah                    | RR        | I                    | H               | A       | Coa-Wld         | 1             | Psa         |
| Cutandia       | meniphitica | Gramineae | Sammah                    | CC        | I-III                | H               | A       | Coa-Snd-Ste     | 2             | Psa-Tac     |
| Cymodon        | dactylon    | Gramineae | Nigel Negem               | CC        | I-III                | H               | P       | Cul             | 5             | Fod-Psa-Wee |
| Cynosurus      | coloratus   | Gramineae | Saltah                    | R         | I-II                 | H               | A       | Cul-Wld         | 1-2           | Wee         |
| Cynosurus      | echinatus   | Gramineae | Saltah                    | R         | I-II                 | H               | A       | Cul-Wld         | 1-2           | Wee         |
| Dactylis       | hispanica   | Gramineae | -                         | C         | I-II                 | H               | A       | Cul-Run         | 4             | Cha         |
| Dactyloctenium | aegyptium   | Gramineae | Na'eeem el Saleeb         | CC        | I-II                 | H               | A       | Cul-Wld         | 2             | Psa-Sum     |
| Desmodia       | philistaea  | Gramineae | Khafor                    | RR        | I-II                 | H               | A       | Rge-Snd         | 2             | Psa         |
| Dichanthium    | annulatum   | Gramineae | Abu Qoseiba, Himmera      | RR        | I-II                 | H               | P       | Cli-Run-Wad     | 3             | Sum         |
| Digitaria      | sanguinalis | Gramineae | Dafifa                    | R         | I-II                 | H               | A       | Cul-Wet         | 1             | Hyg-Sum     |
| Dinebra        | retroflexa  | Gramineae | Deneed, Nigl al Nimr      | C         | I-II                 | H               | A       | Irr             | 1             | Hyg-Wee     |
| Echinochloa    | colona      | Gramineae | Moddeid, Abu Rukba        | CC        | I-II                 | H               | A       | Irr             | 2             | Hyg-Sum     |
| Echinochloa    | crus-galli  | Gramineae | Deneiba                   | CC        | I-II                 | H               | A       | Irr             | 2             | Sum-Wee     |
| Echinochloa    | stagnina    | Gramineae | Omshaar                   | RR        | I-II                 | H               | P       | Can             | 4-5           | Hyd-Sum     |
| Elymus         | elongatus   | Gramineae | Gazzroof                  | CC        | I-II                 | H               | P       | Coa-Snd         | 0             | Psa         |
| Elymus         | fasciatus   | Gramineae | Gazzroof                  | CC        | I-II                 | H               | P       | Coa-Snd         | 0             | Psa         |
| Elytrigia      | cristata    | Gramineae | -                         | FR        | I-II                 | H               | P       | Coa-Dne         | 1             | Psa         |
| Elytrigia      | junccea     | Gramineae | -                         | FR        | I-II                 | H               | P       | Coa-Dne         | 1             | Psa         |
| Eragrostis     | aegyptiaca  | Gramineae | Qaw                       | C         | I-II                 | H               | A       | Cul-Snd         | 1             | Psa-Wee     |
| Eragrostis     | barrelieri  | Gramineae | -                         | R         | I-II                 | H               | A       | Cul-Snd         | 1             | Psa-Wee     |
| Eragrostis     | ciliatensis | Gramineae | Ti raab                   | C         | I-II                 | H               | A       | Wild            | 1             | Wee         |
| Eragrostis     | pilosa      | Gramineae | Heelaggoog                | C         | I-II                 | H               | A       | Wet             | 1             | Hyg-Wee     |
| Eragrostis     | phleoides   | Gramineae | -                         | R         | I-II                 | H               | A       | Wild            | 0             | Wee         |
| Eragrostis     | altissima   | Gramineae | Roqeybe                   | R         | I-II                 | H               | P       | Can-Wee         | 2             | Hyd-Hyg     |
| Hennartha      | marinum     | Gramineae | Reish Hosny               | CC        | I-II                 | H               | A       | Slt             | 1             | Hal         |
| Hordium        | murinum     | Gramineae | Reesh                     | CC        | I-III                | H               | A       | Cul-Wld         | 2             | Nil         |
| Hordium        | spontaneum  | Gramineae | -                         | RR        | I-III                | H               | A       | Cul-Wad         | 2             | Wee         |
| Hordeum        | hirta       | Gramineae | Saf Soof                  | FR        | I-II                 | H               | P       | Run-Ste-Wad     | 3             | Sum         |
| Hypanthrenia   | cylindrica  | Gramineae | Halfa, Del al Quitt       | CC        | I-II                 | H               | P       | Cul-Wet         | 1             | Hyg-Wee     |
| Imperata       | ovatus      | Gramineae | -                         | C         | I-II                 | H               | A       | Snd-Wld         | 0             | Psa         |
| Lagurus        | aurea       | Gramineae | Saltah                    | FC        | I-II                 | H               | A       | Wld             | 0             | Nit         |
| Lamarkia       | scindiclus  | Gramineae | Hada                      | RR        | III-VI               | H               | P       | Des-Dne-Ste     | 3             | Ere-Fod-Psa |
| Lasiosurus     | hexandra    | Gramineae | Sholleik                  | I-II      | H                    | P               | Wet     | 3               | Hyd-Hyg       |             |
| Leersia        | tusca       | Gramineae | Sey foon                  | FC        | I-II                 | H               | P       | Wet             | 2             | Hyg-Pel     |
| Leptochloa     | multiflorum | Gramineae | Simbil, Samma             | FC        | I-II                 | H               | A-B     | Cul-Irr         | 5             | Wee         |
| Lolium         | perenne     | Gramineae | Gazzoon, Hashish al Faras | R         | I-II                 | H               | P-Sh    | Cul-Irr         | 5             | Wee         |
| Lolium         | rigidum     | Gramineae | Saltah                    | C         | I-II                 | H               | A       | Cul-Rge-Ste-Wld | 3             | Psa         |
| Lolium         | temulentum  | Gramineae | Zawaan                    | R         | I-II                 | H               | A-B-Sh  | Cul-Irr         | 4             | Fod-Wee     |

| Genus      | Species      | Vernacular name | Frequency           | Area of distribution | Biological type | Life span | Habitat     | Utilization | Grazing value | Remarks     |         |
|------------|--------------|-----------------|---------------------|----------------------|-----------------|-----------|-------------|-------------|---------------|-------------|---------|
| Lycium     | spartum      | Haifa Mahdouba  | CC                  | I-III                | H               | P         | Rge-Sha-Ste | Han         | 1             | \$04        |         |
| Melica     | minuta       | Gramineae       | RR                  | I-III                | H               | P         | Rge         | Gra         | 3             | Psa         |         |
| Oryza      | sativa       | Gramineae       | R                   | I-III                | H               | P         | Can-Frw     | Cro-Gra     | 3             | Hyd         |         |
| Oryzopsis  | miliacea     | Gramineae       | FC                  | I-III                | H               | P         | Cli-Run     | Gra         | 4             | Cha         |         |
| Panicum    | antidotale   | Gramineae       | RR                  | I-III                | H               | P         | Wad         | Gra         | 4-5           | Fod-Psa     |         |
| Panicum    | coloratum    | Gramineae       | FC                  | I-III                | H               | P         | Irr         | Gra         | 4             | Fod-Sum-Wee |         |
| Panicum    | repens       | Gramineae       | FR                  | I-III                | H               | P         | Cul-Wet     | Gra         | 2-3           | Hyg         |         |
| Panicum    | turgidum     | Gramineae       | C                   | III-VI               | HS              | P         | Des-Ste-Wad | Gra-Med-Sbi | 2             | Ere         |         |
| Parapholis | filiformis   | Gramineae       | —                   | FC                   | I-III           | H         | A           | Slt         | 0             | Hal         |         |
| Parapholis | incurva      | Gramineae       | —                   | R                    | I-III           | H         | A           | Slt         | 0             | Psa         |         |
| Parapholis | marginata    | Gramineae       | —                   | R                    | I-III           | H         | A           | Slt         | 0             | Hal         |         |
| Paspalum   | geminatum    | Gramineae       | Sayfoon, Nisela     | C                    | I-III           | H         | P           | Wet         | 2             | Hyg-Sum     |         |
| Paspalum   | obtusifolium | Gramineae       | Moddeid             | R                    | I-III           | H         | P           | Wet         | 2             | Fod-Hyg-Sum |         |
| Paspalum   | distichum    | Gramineae       | Muddled             | R                    | I-III           | H         | P           | Wild        | 4             | Ere-Psa     |         |
| Pennisetum | divisum      | Gramineae       | Tommam              | RR                   | III-VI          | HS        | P           | Des-Ste-Wad | Gra           | 2           | Cha-Psa |
| Pennisetum | setaceum     | Gramineae       | Sabat               | R                    | I-IV            | H         | P           | Run-Ste-Wad | Gra           | 1           | Hal-Hyg |
| Phalaris   | canariensis  | Gramineae       | —                   | C                    | I-III           | H         | A           | Cul         | 3             | Sil         |         |
| Phalaris   | minor        | Gramineae       | Shaer el Fahr       | CC                   | I-III           | H         | A           | Cul-Rge     | 2             | Sil         |         |
| Phalaris   | paradoxa     | Gramineae       | —                   | CC                   | I-III           | H         | A           | Cul-Rge     | 1             | Pel         |         |
| Phragmites | australis    | Gramineae       | Qasab Hagana, Ghrib | CC                   | I-III           | H         | P           | Slt         | 1             | Nit-Wee     |         |
| Poa        | annua        | Gramineae       | —                   | FC                   | I-III           | H         | A           | Cul-Wid     | Gra           | 1-2         | Nit-Wee |
| Poa        | infirma      | Gramineae       | Sahlah              | FC                   | I-III           | H         | A           | Cul         | Gra           | 0           | Hal     |
| Polygonum  | monspeliacum | Gramineae       | Deil el Qott        | C                    | I-III           | H         | A           | Slt         | 0             | Hal         |         |
| Polygonum  | viridis      | Gramineae       | Deir el Fahr        | C                    | I-III           | H         | P           | Slt         | 0             | Hal         |         |
| Rostraria  | cristata     | Gramineae       | —                   | C                    | I-III           | H         | A           | Cul-Rge     | Gra           | 2           | Sil     |
| Rostraria  | hispida      | Gramineae       | —                   | CC                   | I-III           | H         | A           | Cul-Rge-Ste | Gra           | 2           | Psa     |
| Rostraria  | pumila       | Gramineae       | —                   | CC                   | I-III           | H         | A           | Cul-Rge     | Gra           | 2           | Psa     |
| Saccharum  | spontaneum   | Gramineae       | Boos                | C                    | I-III           | H         | P           | Cul-Wet     | Gra-Sbi-Wbr   | 2           | Hyg     |
| Schismus   | arabicus     | Gramineae       | Bahma               | CC                   | I-III           | H         | A           | Rge-Snd-Ste | Gra           | 3           | Psa     |
| Schismus   | barbatus     | Gramineae       | Bahma               | CC                   | I-III           | H         | A           | Rge-Snd-Ste | Gra           | 3           | Sum-Wee |
| Setaria    | verticillata | Gramineae       | Yadaab, Qamb al Far | CC                   | I-III           | H         | A           | Cul-Wid     | Gra           | 1           | Hyg-Wee |
| Setaria    | halepense    | Gramineae       | De el Far           | R                    | I-III           | H         | A           | Cul-Wet     | Gra           | 3           | Hyg-Wee |
| Sorghum    | virgatum     | Gramineae       | Diarrapp            | R                    | I-III           | H         | A           | Wet         | Non           | 0           | Hyg-Wee |
| Sorghum    | divaricatus  | Gramineae       | Garawa              | —                    | CC              | I-III     | H           | A           | Slt           | 0           | Hal     |
| Sporobolus | pungens      | Gramineae       | Shakaam             | C                    | I               | H         | P           | Qaa-Snd     | Gra           | 0           | Hal     |
| Sporobolus | spicatus     | Gramineae       | Sammah              | C                    | I-III           | H         | P           | Slt         | Gra           | 2           | Hal     |
| Stipa      | capensis     | Gramineae       | Belma/Sabat         | CC                   | I-III           | H         | A           | Rge-Sha-Ste | Gra           | 1           | Sil     |
| Stipa      | lagascae     | Gramineae       | Gawther             | FR                   | I-III           | H         | P           | Rge-Snd-Ste | Gra           | 3-4         | Psa     |
| Stipa      | parviflora   | Gramineae       | Safsoof             | CC                   | I-III           | H         | P           | Roc-Sha-Ste | Gra           | 3           | Cha     |



| Genus               | Species                 | Family      | Vernacular name             | Frequency | Area of distribution | Biological type | Life span | Habitat     | Utilization | Grazing value | Remarks     |         |
|---------------------|-------------------------|-------------|-----------------------------|-----------|----------------------|-----------------|-----------|-------------|-------------|---------------|-------------|---------|
| <i>Teucrium</i>     | <i>brevifolium</i>      | Labiatae    | -                           | FR        | I-III                | Fr              | P         | Rge         | Gra         | 1             | Cha-End     |         |
| <i>Teucrium</i>     | <i>polium</i>           | Labiatae    | Ga'da                       | CC        | I-III                | Fr              | P         | Rge-Sha-Ste | Med         | 0             | Cha         |         |
| <i>Thymus</i>       | <i>capitatus</i>        | Labiatae    | Zaater                      | R         | I-II                 | DS              | P         | Cli-Roc-Ste | Med-Veg     | 1             | Cha         |         |
| <i>Acacia</i>       | <i>ehrenbergiana</i>    | Leguminosae | Serval                      | RR        | II-VI                | HS-T            | P         | Des-Wad     | Gra-Med     | 1             | Ere-Phr     |         |
| <i>Acacia</i>       | <i>radjiana</i>         | Leguminosae | Talh                        | R         | II-VI                | HS-T            | P         | Des-Wad     | Gra-Med     | 3             | Ere-Phr     |         |
| <i>Althagi</i>      | <i>graecorum</i>        | Leguminosae | Agod, Aq.                   | FC        | III-VI               | Fr              | P         | Sh-Wld      | Gra-Med     | 1             | Hal-Phr     |         |
| <i>Anagris</i>      | <i>foetida</i>          | Leguminosae | Garrood, Karroub el Khinzir | RR        | I-II                 | HS              | P         | Cul-Rge     | Med         | T             | Sil         |         |
| <i>Anthyllis</i>    | <i>vulneraria</i>       | Leguminosae | -                           | RR        | I-II                 | H               | A-P       | Cul-Rge-Ste | Gra-Med     | 2-3           | Wee         |         |
| <i>Argyrolobium</i> | <i>uniflorum</i>        | Leguminosae | Leguminosae                 | FR        | I-VI                 | DS              | P         | Rge-Snd-Ste | Gra         | 4             | Psa         |         |
| <i>Astragalus</i>   | <i>asterias</i>         | Leguminosae | Abu Egeifa                  | R         | I-II                 | H               | A         | Cul-Rge     | Gra         | 1-2           | Psa         |         |
| <i>Astragalus</i>   | <i>boeticus</i>         | Leguminosae | Mehallaq                    | C         | I-II                 | H               | A         | Cul-Wld     | Non         | 0             | Wee         |         |
| <i>Astragalus</i>   | <i>caprinus</i>         | Leguminosae | -                           | C         | I-III                | H               | P         | Rge-Ste-Wld | Non         | 0             | Psa         |         |
| <i>Astragalus</i>   | <i>fruticosus</i>       | Leguminosae | Leguminosae                 | C         | I-III                | Fr              | P         | Rge         | Non         | 0             | Ere         |         |
| <i>Astragalus</i>   | <i>hamosus</i>          | Leguminosae | Qorein                      | C         | I-II                 | H               | A         | Cul-Wld     | Non         | 0             | Sil-Wee     |         |
| <i>Astragalus</i>   | <i>hauarensis</i>       | Leguminosae | Daniel Farah                | R         | II-VI                | H               | A         | Rge-Snd     | Gra         | 3-4           | Psa-Tac     |         |
| <i>Astragalus</i>   | <i>hispidulus</i>       | Leguminosae | -                           | R         | II-IV                | H               | A         | Des-Rge     | Gra         | 2             | Psa-Tac     |         |
| <i>Astragalus</i>   | <i>mareoticus</i>       | Leguminosae | Leguminosae                 | R         | I-III                | H               | A         | Rge         | Gra         | 2             | Psa         |         |
| <i>Astragalus</i>   | <i>spinosus</i>         | Leguminosae | -                           | CC        | II-VI                | DS              | P         | Rge-Wld     | Gra         | 1             | Ere         |         |
| <i>Astragalus</i>   | <i>tribuloides</i>      | Leguminosae | Bel et Gamei                | CC        | I-II                 | H               | A         | Cul-Rge     | Non         | 0             | Psa-Tac-Wee |         |
| <i>Astragalus</i>   | <i>trigonus</i>         | Leguminosae | -                           | FC        | III-VI               | DS              | P         | Des-Wad     | Gra         | 1             | Ere         |         |
| <i>Ebenus</i>       | <i>armitaginei</i>      | Leguminosae | -                           | RR        | I                    | Fr              | P         | Rge-Roc     | Gra         | 2             | Cha-End     |         |
| <i>Hedysarum</i>    | <i>coronarium</i>       | Leguminosae | -                           | RR        | I-II                 | H               | A-B       | Irr         | Gra         | 5             | Fod-Pel     |         |
| <i>Hedysarum</i>    | <i>spinossissimum</i>   | Leguminosae | -                           | R         | I-III                | H               | A         | Rge-Snd-Ste | Gra         | 3             | Psa         |         |
| <i>Hippocratea</i>  | <i>areolata</i>         | Leguminosae | Leguminosae                 | CC        | I-II                 | H               | A         | Rge-Ste     | Gra         | 3             | Psa         |         |
| <i>Hippocratea</i>  | <i>cyclocarpa</i>       | Leguminosae | -                           | CC        | I-II                 | H               | A         | Cul-Rge     | Gra         | 2             | Sil         |         |
| <i>Hippocratea</i>  | <i>unisiliquosa</i>     | Leguminosae | Omm Danara                  | RR        | I-III                | H               | A         | Rge-Ste     | Gra         | 3             | Psa         |         |
| <i>Hymenocarpus</i> | <i>circinatus</i>       | Leguminosae | -                           | R         | I-II                 | H               | A         | Cul-Rge-Ste | Gra         | 1             | Wee         |         |
| <i>Lathyrus</i>     | <i>aphaca</i>           | Leguminosae | Leguminosae                 | CC        | I-II                 | H               | A         | Cul         | Gra         | 3             | Wee         |         |
| <i>Lathyrus</i>     | <i>hirsutus</i>         | Leguminosae | Leguminosae                 | C         | I-II                 | H               | A         | Cul         | Gra         | 2             | Wee         |         |
| <i>Lathyrus</i>     | <i>marmoratus</i>       | Leguminosae | -                           | CC        | I-II                 | H               | A         | Cul         | Gra         | 2             | Wee         |         |
| <i>Lathyrus</i>     | <i>pseudocicerina</i>   | Leguminosae | -                           | FC        | I-II                 | H               | A         | Cul         | Gra         | 2             | Wee         |         |
| <i>Lathyrus</i>     | <i>sativus</i>          | Leguminosae | Leguminosae                 | C         | I-II                 | H               | A         | Cul         | Gra         | 2             | Wee         |         |
| <i>Lathyrus</i>     | <i>setifolius</i>       | Leguminosae | -                           | RR        | I-II                 | H               | A         | Cul         | Gra         | 2             | Wee         |         |
| <i>Lotus</i>        | <i>corniculatus</i>     | Leguminosae | Rig al Astur                | RR        | I-II                 | H               | P         | Cul-Wet     | Gra         | 5             | Hyg         |         |
| <i>Lotus</i>        | <i>creticus</i>         | Leguminosae | Eslib                       | C         | I-II                 | H               | H         | P           | Rge-Snd-Ste | Gra           | 4           | Psa     |
| <i>Lotus</i>        | <i>cystistoides</i>     | Leguminosae | Rig al Astur                | RR        | I-II                 | H               | H         | P           | Qaa-Rge-Snd | Gra           | 3           | Hal-Psa |
| <i>Lotus</i>        | <i>edulis</i>           | Leguminosae | -                           | R         | I-II                 | H               | H         | Cul         | Gra         | 1             | Wee         |         |
| <i>Lotus</i>        | <i>halophilus</i>       | Leguminosae | Herbith                     | CC        | I-III                | H               | A         | Cul-Rge-Ste | Gra         | 1-2           | Psa         |         |
| <i>Lotus</i>        | <i>ornithopodioides</i> | Leguminosae | Ommelkeishat                | R         | I-II                 | H               | A         | Cul         | Gra         | 1             | Wee         |         |
| <i>Lotus</i>        | <i>palustris</i>        | Leguminosae | -                           | RR        | I-II                 | H               | P         | Cul-Wet     | Gra         | 3             | Hyg         |         |

| Genus             | Species                     | Vernacular name | Frequency | Area of distribution | Biological type | Life span    | Habitat      | Utilization  | Grazing value   | Remarks |
|-------------------|-----------------------------|-----------------|-----------|----------------------|-----------------|--------------|--------------|--------------|-----------------|---------|
| <i>Lotus</i>      | <i>pedunculatus</i>         | Leguminosae     | -         | I-II                 | P               | Cul-Wet      | Gra          | 4            | Hal-Hyg         |         |
| <i>Lotus</i>      | <i>polyphyllus</i>          | Leguminosae     | -         | C                    | P               | Coa-Dne      | Gra          | 0            | Hal-Psa         |         |
| <i>Lotus</i>      | <i>tetragonolobus</i>       | Leguminosae     | -         | C                    | P               | Cul-Wet      | Gra          | 4            | Hal-Hyg         |         |
| <i>Medicago</i>   | <i>arabica</i>              | Leguminosae     | -         | R                    | A               | Cul          | Gra          | 2            | Wee             |         |
| <i>Medicago</i>   | <i>coronata</i>             | Leguminosae     | -         | R                    | A               | Cul-Wld      | Gra          | 2-3          | Wee             |         |
| <i>Medicago</i>   | <i>hypogea</i>              | Leguminosae     | -         | R                    | A               | Cul-Rge-Site | Gra          | 2            | Wee             |         |
| <i>Medicago</i>   | <i>intertexta</i>           | Leguminosae     | -         | R                    | A               | Cul-Rge      | Gra          | 2-3          | Wee             |         |
| <i>Medicago</i>   | <i>lacinata</i>             | Leguminosae     | -         | FC                   | I-IV            | A            | Cul-Rge-Site | Gra          | 2-3             | Psa-Tac |
| <i>Medicago</i>   | <i>litoralis</i>            | Leguminosae     | -         | CC                   | I-III           | A            | Cul-Rge-Site | Gra          | 2-3             | Psa     |
| <i>Medicago</i>   | <i>lupulina</i>             | Leguminosae     | -         | R                    | I-II            | H            | A-B-Sh       | Gra          | 2-3             | Wee     |
| <i>Medicago</i>   | <i>marina</i>               | Leguminosae     | -         | C                    | I               | H            | P            | Coa-Snd      | Non             | 0       |
| <i>Medicago</i>   | <i>minima</i>               | Leguminosae     | -         | FR                   | I-IV            | H            | A            | Rge-Site     | Gra             | 1       |
| <i>Medicago</i>   | <i>monspeliacana</i>        | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul-Rge      | Non             | 0       |
| <i>Medicago</i>   | <i>orbicularis</i>          | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul          | Gra             | 0       |
| <i>Medicago</i>   | <i>polycerata</i>           | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul-Rge      | Non             | 0       |
| <i>Medicago</i>   | <i>polymorpha</i>           | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul          | Gra             | 0       |
| <i>Medicago</i>   | <i>rigida</i>               | Leguminosae     | -         | RR                   | I-II            | H            | A            | Cul-Rge      | Non             | 0       |
| <i>Medicago</i>   | <i>truncatula</i>           | Leguminosae     | -         | C                    | I-III           | H            | A            | Cul-Rge-Site | Gra             | 0       |
| <i>Medicago</i>   | <i>tuberculata</i>          | Leguminosae     | -         | RR                   | I-II            | H            | A            | Cul-Rge      | Non             | 0       |
| <i>Medicago</i>   | <i>elegans</i>              | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul-Rge      | Gra             | 0       |
| <i>Melilotus</i>  | <i>indicus</i>              | Leguminosae     | -         | RR                   | I-II            | H            | A            | Cul-Rge      | Med             | 0       |
| <i>Melilotus</i>  | <i>sulcatus</i>             | Leguminosae     | -         | CC                   | I-II            | H            | A            | Cul-Rge      | Med             | 0       |
| <i>Melilotus</i>  | <i>crista-galli</i>         | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul-Rge      | Non             | 0       |
| <i>Melilotus</i>  | <i>mitissima</i>            | Leguminosae     | -         | R                    | I-II            | H            | A            | Rge-Snd      | Gra             | 2       |
| <i>Melilotus</i>  | <i>natrix subsp. natrix</i> | Leguminosae     | -         | RR                   | I-II            | H            | A            | Cul-Wld      | Non             | 0       |
| <i>Melilotus</i>  | <i>reclinata</i>            | Leguminosae     | -         | C                    | I-II            | H            | A            | Rge          | Gra             | 0       |
| <i>Melilotus</i>  | <i>serrata</i>              | Leguminosae     | -         | C                    | I-II            | H            | A            | Cul-Snd      | Non             | 0       |
| <i>Ononis</i>     | <i>sicula</i>               | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul-Wld      | Non             | 0       |
| <i>Ononis</i>     | <i>vaginalis</i>            | Leguminosae     | -         | CC                   | I-II            | H            | P            | Rge          | Gra             | 1       |
| <i>Ononis</i>     | <i>sativum</i>              | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul          | Non             | 0       |
| <i>Ononis</i>     | <i>farfaria</i>             | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul-Snd      | Non             | 0       |
| <i>Ononis</i>     | <i>juliflora</i>            | Leguminosae     | -         | R                    | I-II            | H            | A            | Cul-Wld      | Fle             | 0       |
| <i>Ononis</i>     | <i>monosperma</i>           | Leguminosae     | -         | FC                   | I-II            | HS-T         | P            | Wld          | Fen-Fue-Fsh-Gra | 2-3     |
| <i>Pisum</i>      | <i>raetam</i>               | Leguminosae     | -         | RR                   | I-II            | HS           | P            | Rge-Wrd      | Fue-Gra-Sbi     | 1-2     |
| <i>Prosopis</i>   | <i>muricatus</i>            | Leguminosae     | -         | R                    | I-V             | HS           | P            | Rge-Wrd      | Fue-Gra-Med-Sbi | 1-2     |
| <i>Prosopis</i>   | <i>secundiflora</i>         | Leguminosae     | -         | FC                   | I-II            | HS           | P            | Rge-Wrd      | Fue-Gra-Sbi     | 1-2     |
| <i>Retama</i>     | <i>raetam</i>               | Leguminosae     | -         | CC                   | I-II            | HS           | P            | Rge-Wrd      | Fue-Gra-Med-Sbi | 1-2     |
| <i>Scorpiurus</i> | <i>Secundigera</i>          | Leguminosae     | -         | R                    | I-II            | HS           | P            | Rge-Wrd      | Fue-Gra-Sbi     | 1-2     |
| <i>Sesbania</i>   | <i>Seebeaan</i>             | Leguminosae     | -         | RR                   | I-II            | HS           | P            | Irr          | Wbr             | -       |
| <i>Trifolium</i>  | <i>alexandrinum</i>         | Leguminosae     | -         | CC                   | I-II            | HS           | P            | Irr          | Cro             | 5       |
| <i>Trifolium</i>  | <i>angustifolium</i>        | Leguminosae     | -         | RR                   | I-II            | HS           | P            | Irr          | Gra             | 1       |
| <i>Trifolium</i>  | <i>argutum</i>              | Leguminosae     | -         | R                    | I-II            | HS           | P            | Cul          | Gra             | 1       |

| Genus         | Species        | Vernacular name        | Frequency | Area of distribution | Biological type | Life span | Habitat | Utilization | Grazing value | Remarks     |  |
|---------------|----------------|------------------------|-----------|----------------------|-----------------|-----------|---------|-------------|---------------|-------------|--|
| Trifolium     | campestre      | Leguminosae            | R         | I-II                 | A               | Cul       | Gra     | 1           | Wee           |             |  |
| Trifolium     | desyrum        | Leguminosae            | -         | R                    | A               | Cul-Irr   | Gra     | 1-2         | Wee           |             |  |
| Trifolium     | fragiferum     | Leguminosae            | -         | RR                   | I-II            | Wet       | Cro     | 5           | Fod-Hal       |             |  |
| Trifolium     | nigrescens     | Leguminosae            | -         | RR                   | I-II            | A         | Gra     | 1           | Wee           |             |  |
| Trifolium     | patens         | Leguminosae            | -         | RR                   | I-II            | A         | Gra     | 1-2         | Wee           |             |  |
| Trifolium     | purpureum      | Leguminosae            | -         | R                    | I-II            | A         | Cul     | Cro         | 5             | Fod         |  |
| Trifolium     | resupinatum    | Leguminosae            | -         | CC                   | I-II            | A         | Wet     | Cro         | 5             | Fod-Hal     |  |
| Trifolium     | scabrum        | Leguminosae            | -         | RR                   | I-II            | A         | Cul     | Gra         | 1             | Wee         |  |
| Trifolium     | stellatum      | Leguminosae            | -         | R                    | I-II            | A         | Cul     | Gra         | 1-2           | Wee         |  |
| Trifolium     | tomentosum     | Kreishit               | -         | C                    | I-II            | A         | Rge-Wet | Gra         | 1-2           | Wee         |  |
| Trifolium     | anguina        | Widaina                | -         | FC                   | I-IV            | H         | Cul-Wld | Non         | 0             | Hal-Tac-Wee |  |
| Trifolium     | arabica        | Leguminosae            | -         | R                    | I-II            | H         | Cul-Snd | Gra         | 4             | Psa         |  |
| Trifolium     | brythaea       | Leguminosae            | -         | RR                   | I-II            | H         | Cul     | Non         | 0             | Wee         |  |
| Trifolium     | cylindrica     | Leguminosae            | -         | R                    | I-II            | H         | Cul     | Non         | 0             | Wee         |  |
| Trifolium     | glabra         | Leguminosae            | -         | CC                   | I-II            | H         | Cul     | Non         | 0             | Wee         |  |
| Trifolium     | lacinata       | Leguminosae            | -         | RR                   | I-II            | H         | Cul     | Non         | 0             | Wee         |  |
| Trifolium     | maritima       | Deraaq, Istib al Malik | -         | C                    | I-II            | H         | Cul     | Non         | 0             | Hal-Wee     |  |
| Trifolium     | occulta        | Deraaq                 | -         | R                    | I-II            | H         | Cul     | Non         | 0             | Wee         |  |
| Trifolium     | stellata       | Gargas                 | -         | C                    | I-II            | H         | Cul     | Non         | 0             | Hal-Wee     |  |
| Trifolium     | tetraphyllum   | Leguminosae            | -         | RR                   | I-II            | H         | Cul     | Non         | 0             | Sil-Wee     |  |
| Vicia         | ervilla        | Deraaq                 | -         | RR                   | I-II            | H         | Cul     | Non         | 0             | Pei-Wee     |  |
| Vicia         | lutea          | Bakr                   | -         | C                    | I-II            | H         | Cul     | Gra         | 2             | Wee         |  |
| Vicia         | monantha       | Khareg                 | -         | CC                   | I-III           | H         | Cul     | Gra         | 2             | Wee         |  |
| Vicia         | narbonensis    | Noonan Berri           | -         | C                    | I-II            | H         | Cul     | Gra         | 3             | Psa         |  |
| Vicia         | peregrina      | Leguminosae            | -         | R                    | I-II            | H         | Cul     | Gra         | 2             | Wee         |  |
| Vicia         | sativa         | Leguminosae            | -         | CC                   | I-II            | H         | Cul     | Cro-Med     | 5             | Fod         |  |
| Vicia         | villosa        | Leguminosae            | -         | RR                   | I-II            | H         | Cul     | Gra         | 3             | Wee         |  |
| Vicia         | gibba          | Leguminosae            | -         | Eddis                | I-II            | H         | A-B     | Cul         | Hyd           |             |  |
| Vicia         | hyalina        | Leguminosae            | -         | CC                   | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Vicia         | polyrrhiza     | Leguminosae            | -         | C                    | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Lemna         | adonis         | Ades el Mya            | -         | FR                   | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Pseudowolffia | barthianum     | Ades el Mya            | -         | R                    | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Spirodela     | blomfeldianum  | Ades el Mya            | -         | FC                   | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | ampeloprasum   | Thoam                  | -         | RR                   | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | aschersonianum | Liliaceae              | -         | R                    | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | barthianum     | Liliaceae              | -         | R                    | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | blomfeldianum  | Liliaceae              | -         | RR                   | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | curtum         | Liliaceae              | -         | R                    | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | desertorum     | Liliaceae              | -         | RR                   | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | erdelii        | Liliaceae              | -         | R                    | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | mareoticum     | Liliaceae              | -         | RR                   | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | myrianthum     | Liliaceae              | -         | R                    | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |
| Allium        | pallens        | Liliaceae              | -         | R                    | I-II            | H         | Cul     | Can-Frw-We  | 0             | Hyd         |  |

| Genus        | Species         | Vernacular name | Frequency    | Area of distribution | Biological type | Life span | Habitat     | Utilization | Grazing value | Remarks     |         |
|--------------|-----------------|-----------------|--------------|----------------------|-----------------|-----------|-------------|-------------|---------------|-------------|---------|
| Allium       | roseum          | Liliaceae       | R            | I-IV                 | H               | P         | Cul-Wld     | Gra-Veg     | 3             | Psa         |         |
| Allium       | sphaerocephalon | Liliaceae       | R            | I-II                 | H               | P         | Cul-Wld     | Non         | 0             | Wee         |         |
| Allium       | trifoliatum     | Liliaceae       | RR           | I-II                 | H               | P         | Cul-Wld     | Non         | 0             | Wee         |         |
| Asparagus    | aphyllus        | Liliaceae       | FC           | I-III                | H               | P         | Rge-Ran-Wld | Non         | 0             | Cha         |         |
| Asparagus    | stipularis      | Liliaceae       | R            | I-III                | S               | P         | Wld         | Fle         | 0             | Fce         |         |
| Asparagus    | ramosus         | Liliaceae       | Aqool        | I-III                | H               | P         | Rge-Ste-Wld | Gra         | 2             | Nit-Psa     |         |
| Asphodelus   | tenuifolius     | Liliaceae       | Ansal        | I-III                | H               | A         | Rge-Ste-Wld | Non         | 0             | Nit-Psa     |         |
| Asphodelus   | viscidulus      | Liliaceae       | Baaroos      | I-II                 | H               | A         | Rge-Ste-Wld | Non         | 0             | Nit-Psa-Tac |         |
| Asphodelus   | eigii           | Liliaceae       | Berouagh     | I-II                 | H               | P         | Cul         | Non         | 0             | Wee         |         |
| Bellevalia   | flexuosa        | Liliaceae       | Bosseil      | RR                   | H               | P         | Cul         | Non         | 0             | Wee         |         |
| Bellevalia   | macrobotrys     | Liliaceae       | Bosseil      | C                    | I-II            | H         | P           | Cul         | Non           | 0           | Wee     |
| Bellevalia   | mauritanica     | Liliaceae       | Bosseil      | RR                   | I-II            | H         | P           | Cul         | Non           | 0           | Wee     |
| Bellevalia   | romana          | Liliaceae       | Bosseil      | RR                   | I-II            | H         | P           | Cul         | Non           | 0           | Wee     |
| Bellevalia   | sessiliflora    | Liliaceae       | Bosseil      | RR                   | I-II            | H         | P           | Cul         | Non           | 0           | Wee     |
| Bellevalia   | trifoliata      | Liliaceae       | Bosseil      | R                    | I-II            | H         | P           | Cul         | Non           | 0           | Wee     |
| Cochlicicum  | ritchii         | Liliaceae       | Okra         | FR                   | I-II            | H         | P           | Cul-Ste-Wld | Non           | T           | Sil-Wee |
| Dipcadi      | erythraeum      | Liliaceae       | Hankai-ay    | R                    | I-II            | H         | P           | Rge-Ste-Wld | Non           | 0           | Psa     |
| Gagea        | djana           | Liliaceae       | -            | R                    | I-II            | H         | P           | Rge-Wld     | Non           | 0           | Wee     |
| Gagea        | fibrosa         | Liliaceae       | -            | R                    | I-II            | H         | P           | Rge-Wld     | Non           | 0           | Wee     |
| Gagea        | reticulata      | Liliaceae       | -            | R                    | I-II            | H         | P           | Rge-Wld     | Non           | 0           | Wee     |
| Muscari      | albiflorum      | Liliaceae       | Bosseil      | RR                   | I-II            | H         | P           | Cul-Wld     | Non           | 0           | Wee     |
| Muscari      | bicolor         | Liliaceae       | Bosseil      | RR                   | I-II            | H         | P           | Cul-Wld     | Non           | 0           | Wee     |
| Muscari      | comosum         | Liliaceae       | Bosseil      | CC                   | I-II            | H         | P           | Cul-Wld     | Non           | 0           | Wee     |
| Muscari      | neglectum       | Liliaceae       | Bosseil      | R                    | I-III           | H         | P           | Cul-Wld     | Non           | 0           | Wee     |
| Muscari      | parviflorum     | Liliaceae       | Bosseil      | R                    | I-II            | H         | P           | Cul-Wld     | Non           | 0           | Wee     |
| Muscari      | narbonense      | Liliaceae       | -            | RR                   | I-II            | H         | P           | Cul         | Non           | 0           | Wee     |
| Ornithogalum | trichophyllum   | Liliaceae       | Basol Hanash | R                    | I-II            | H         | P           | Cul         | Non           | 0           | Wee     |
| Scilla       | peruviana       | Liliaceae       | -            | R                    | I-II            | H         | P           | Rge-Wld     | Non           | T           | Wee     |
| Urginea      | undulata        | Liliaceae       | -            | C                    | I-II            | H         | P           | Rge-Ste-Wld | Gra           | 1           | Wee     |
| Linum        | decumbens       | Linaceae        | -            | RR                   | I-II            | H         | A           | Cul-Rge     | Gra           | 1           | Psa     |
| Linum        | strictum        | Linaceae        | Kittan       | R                    | I-II            | H         | A           | Cul-Rge     | Gra           | 1           | Psa     |
| Ammania      | auriculata      | Lythraceae      | Rig el Hamma | R                    | I-II            | H         | A           | Wet         | Non           | 0           | Hyg     |
| Ammania      | baccifera       | Lythraceae      | Rig el Hamma | C                    | I-II            | H         | A           | Wet         | Non           | 0           | Hyg     |
| Ammania      | multiflora      | Lythraceae      | Rig el Hamma | RR                   | I-II            | H         | A           | Wet         | Non           | 0           | Hyg     |
| Ammania      | senegalensis    | Lythraceae      | Rig el Hamma | R                    | I-II            | H         | A           | Wet         | Non           | 0           | Hyg     |
| Lythrum      | hyssopifolia    | Lythraceae      | -            | C                    | I-III           | H         | A           | Wet         | Non           | 0           | Hyg     |
| Lythrum      | juncinum        | Lythraceae      | -            | R                    | I-II            | H         | P           | Wet         | Non           | 0           | Hyg     |
| Lythrum      | tribracteatum   | Lythraceae      | -            | R                    | I-II            | H         | A           | Wet         | Non           | 0           | Hyg     |
| Alcea        | acaulis         | Malvaceae       | Khatma       | RR                   | I-II            | H         | A           | Cul-Wld     | Non           | 0           | Wee     |
| Althea       | ludwigii        | Malvaceae       | Khatma       | FC                   | II-IV           | H         | A           | Rge-Wld     | Gra           | 2           | Ere-Psa |

| Genus              | Species                               | Family           | Vernacular name    | Frequency | Area of distribution | Biological type | Habitat | Utilization | Grazing value | Remarks |
|--------------------|---------------------------------------|------------------|--------------------|-----------|----------------------|-----------------|---------|-------------|---------------|---------|
| <i>Hibiscus</i>    | <i>tronum</i>                         | Malvaceae        | Teel Shettni       | FC        | I-II                 | A               | Cul     | Non         | 0             | Pel     |
| <i>Lavatera</i>    | <i>cretica</i>                        | Malvaceae        | Khatma             | R         | I-II                 | A-B             | Cul     | 0m          | 0             | Wee     |
| <i>Malva</i>       | <i>aegyptia</i>                       | Malvaceae        | Raqma              | FR        | I-III                | H               | Rge-Wld | Gra-Veg     | 1-2           | Psa     |
| <i>Malva</i>       | <i>nicaensis</i>                      | Malvaceae        | Khobbiza           | FC        | I-II                 | H               | A       | Gra-Veg     | 1-2           | Nit     |
| <i>Malva</i>       | <i>parviflora</i>                     | Malvaceae        | Khobbiza           | CC        | I-II                 | H               | A       | Gra-Med-Veg | 1-2           | Nit     |
| <i>Malva</i>       | <i>sylvestris</i>                     | Malvaceae        | Khobbiza           | FC        | I-II                 | H               | A       | Gra-Med-Veg | 1-2           | Nit     |
| <i>Malva</i>       | <i>alba</i>                           | Malvaceae        | -                  | FC        | I-III                | H               | P       | Rge-Wld     | 1             | Wee     |
| <i>Sida</i>        | <i>aegyptiaca</i>                     | Marsileaceae     | Qoreya             | R         | I-II                 | F               | P       | Can-Wej     | 0             | Hyd     |
| <i>Marsilea</i>    | <i>lotoides</i>                       | Molluginaceae    | Ghobbeira, Mughera | R         | I-III                | H               | A       | Wild        | 0             | Hal     |
| <i>Glinus</i>      | <i>procumbens</i>                     | Neuradaceae      | Losseiq            | CC        | II-VI                | H               | A       | Rge-Snd-Ste | 0             | Psa-Tac |
| <i>Neurada</i>     | <i>coerulea</i>                       | Nymphaceae       | Bastneen azreg     | C         | I-II                 | H               | P       | Frw         | 0m            | Hyd     |
| <i>Nymphaea</i>    | <i>lotus</i>                          | Nymphaceae       | Bastneen abiod     | C         | I-II                 | H               | P       | Frw         | Med-0m        | 0       |
| <i>Olea</i>        | <i>europea</i> subsp. <i>oleaster</i> | Oleaceae         | Zebuj              | RR        | I-II                 | TS              | P       | Fish-Non    | 3             | FoRe    |
| <i>Phillyrea</i>   | <i>media</i>                          | Oleaceae         | -                  | RR        | I-II                 | TS              | P       | Fue         | 3             | FoRe    |
| <i>Ephedrum</i>    | <i>stolonifera</i>                    | Onagraceae       | Alfa, Sikh         | FC        | I-II                 | H               | P       | Non         | 0             | Hyg     |
| <i>Ludwigia</i>    | <i>phillypaea</i>                     | Orobanchaceae    | Haook, Danum       | R         | I-II                 | H               | P       | Wet         | 0             | Hyg     |
| <i>Cistanche</i>   | <i>tubulosa</i>                       | Orobanchaceae    | -                  | CC        | I-II                 | Par             | P       | Med         | 0             | Hal-Wee |
| <i>Cistanche</i>   | <i>violacea</i>                       | Orobanchaceae    | -                  | FR        | I-II                 | Par             | P       | Non         | 0             | Hal-Wee |
| <i>Cistanche</i>   | <i>cernua</i>                         | Orobanchaceae    | -                  | FR        | I-II                 | Par             | P       | Non         | 0             | Hal-Wee |
| <i>Orobanche</i>   | <i>crenata</i>                        | Orobanchaceae    | -                  | R         | I-II                 | Par             | A       | Par         | 0             | Wee     |
| <i>Orobanche</i>   | <i>lavandulacea</i>                   | Orobanchaceae    | -                  | CC        | I-II                 | Par             | A       | Par         | 0             | Wee     |
| <i>Orobanche</i>   | <i>minor</i>                          | Orobanchaceae    | -                  | RR        | I-III                | Par             | A       | Par         | 0             | Wee     |
| <i>Orobanche</i>   | <i>ramosa</i>                         | Orobanchaceae    | -                  | R         | I-II                 | Par             | A       | Par         | 0             | Wee     |
| <i>Orobanche</i>   | <i>schultzii</i>                      | Orobanchaceae    | Haook              | CC        | I-III                | Par             | A       | Par         | 0             | Wee     |
| <i>Oxalis</i>      | <i>corniculata</i>                    | Oxalidaceae      | -                  | RR        | I-III                | Par             | A       | Par         | 0             | Wee     |
| <i>Oxalis</i>      | <i>pes-caprae</i>                     | Oxalidaceae      | -                  | FC        | I-II                 | H               | P       | Cul-Wld     | 0             | Wee     |
| <i>Phoenix</i>     | <i>dactylifera</i>                    | Orobanchaceae    | -                  | C         | I-II                 | H               | P       | Cul-Wld     | 0             | Wee     |
| <i>Glaucium</i>    | <i>arabicum</i>                       | Orobanchaceae    | -                  | CC        | I-IV                 | H               | P       | Cul-Rin-Wad | 0             | Phr     |
| <i>Glaucium</i>    | <i>corniculatum</i>                   | Oxalidaceae      | -                  | R         | I-II                 | H               | P       | Cul         | 0             | Wee     |
| <i>Glaucium</i>    | <i>grandiflorum</i>                   | Oxalidaceae      | -                  | R         | I-II                 | H               | A       | Cul-Wld     | 0             | Wee     |
| <i>Papaver</i>     | <i>argemone</i>                       | Papaveraceae     | -                  | R         | I-II                 | H               | A       | Wild        | 0             | Wee     |
| <i>Papaver</i>     | <i>dubium</i>                         | Papaveraceae     | -                  | RR        | I-II                 | H               | A       | Cul         | 0             | Wee     |
| <i>Papaver</i>     | <i>humile</i>                         | Papaveraceae     | -                  | R         | I-II                 | H               | A       | Cul         | 0             | Wee     |
| <i>Papaver</i>     | <i>hybridum</i>                       | Papaveraceae     | -                  | C         | I-II                 | H               | A       | Cul         | 0             | Wee     |
| <i>Papaver</i>     | <i>rheas</i>                          | Papaveraceae     | Ben Na am          | CC        | I-II                 | H               | A       | Cul         | Med           | 0       |
| <i>Roemeria</i>    | <i>hybrida</i>                        | Papaveraceae     | -                  | R         | I-II                 | H               | A       | Cul         | Non           | Tac-Wee |
| <i>Potamogeton</i> | <i>ciprus</i>                         | Potamogetonaceae | Horreish           | CC        | I-II                 | H               | P       | Can-Frw     | 0m            | Hyd     |
| <i>Potamogeton</i> | <i>lucens</i>                         | Potamogetonaceae | -                  | RR        | I-II                 | H               | P       | Can-Frw     | 0m            | Hyd     |
| <i>Potamogeton</i> | <i>nodosus</i>                        | Potamogetonaceae | -                  | FC        | I-II                 | H               | P       | Can-Frw     | 0             | Hyd     |

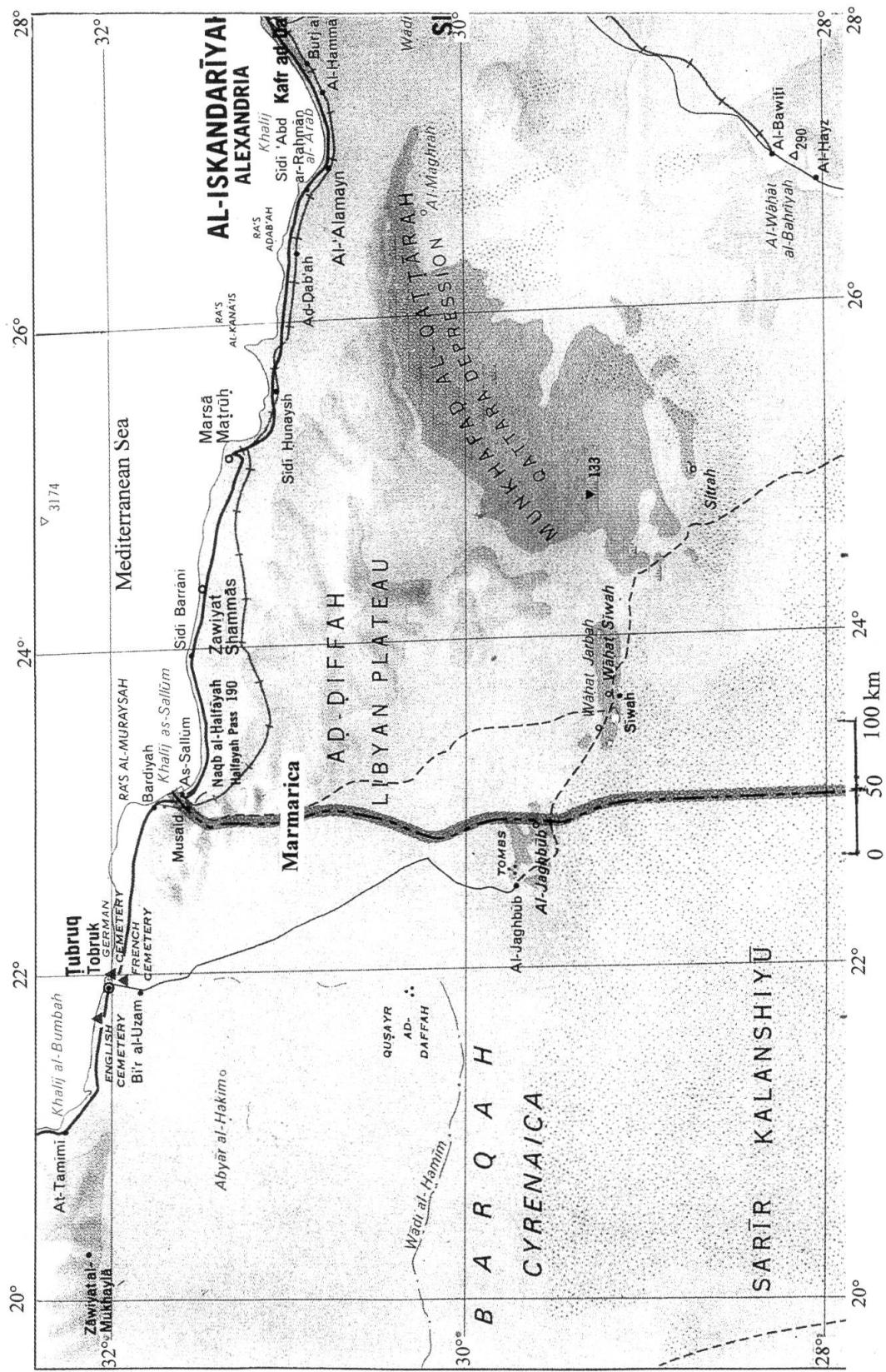
| Genus        | Species       | Vernacular name  | Frequency              | Area of distribution | Biological type | Habitat | Life span  | Utilization  | Grazing value | Remarks     |
|--------------|---------------|------------------|------------------------|----------------------|-----------------|---------|------------|--------------|---------------|-------------|
| Potamogeton  | pectinatus    | Potamogetonaceae | CC                     | I-II                 | H               | P       | Can-Fw     | 0rn          | 0             | Hyd         |
| Plantago     | africana      | Plantaginaceae   | R                      | I-II                 | H               | A       | Cul-Wld    | Med          | 0             | Psa-Tac     |
| Plantago     | albicans      | Plantaginaceae   | CC                     | I-III                | H               | P       | Rge-Snd-St | Gra          | 4-5           | Psa         |
| Plantago     | arenaria      | Plantaginaceae   | R                      | I-II                 | H               | A       | Cul        | Non          | 0             | Psa         |
| Plantago     | coronopus     | Plantaginaceae   | Wideneia               | I-III                | H               | A       | Wld        | Gra-Med      | 1             | Hal         |
| Plantago     | crassifolia   | Plantaginaceae   | -                      | I-II                 | H               | P       | Slt        | Gra          | 3             | Hal         |
| Plantago     | crysoides     | Plantaginaceae   | FR                     | I-III                | H               | A       | Wld        | Gra          | 2             | Hal         |
| Plantago     | cylindrica    | Plantaginaceae   | CC                     | I-III                | H               | A       | Irr        | Non          | 0             | Wee         |
| Plantago     | lagopus       | Plantaginaceae   | Berkhemi               | I-II                 | H               | A       | Irr        | Non          | 0             | Sil         |
| Plantago     | major         | Plantaginaceae   | Wina                   | FC                   | I-II            | H       | A          | Med          | 0             | Hyg-Nit-Sil |
| Plantago     | norata        | Plantaginaceae   | Waraaq, Lisan al Hamal | R                    | I-II            | H       | A          | Irr          | 2             | Psa         |
| Plantago     | ovata         | Plantaginaceae   | Yanam                  | R                    | I-II            | H       | A          | Rge          | 2             | Sil         |
| Plantago     | phaeostoma    | Plantaginaceae   | Gesseima               | CC                   | I-III           | H       | A          | Rge          | 2             | Sil         |
| Plantago     | squarrosa     | Plantaginaceae   | -                      | R                    | I-II            | H       | A          | Cul-Rge      | 1             | Psa-Tac     |
| Plantago     | weldenii      | Plantaginaceae   | Gesseima               | C                    | I-II            | H       | A          | Cul          | 0             | Sil         |
| Plantago     | guyonianum    | Plumbaginaceae   | Zetia                  | RR                   | I-III           | HS      | P          | Fue          | 0             | Hal         |
| Limoniastrum | monopetalum   | Plumbaginaceae   | Zetia                  | C                    | I-II            | HS      | P          | Fue          | 0             | Hal         |
| Limonium     | echioides     | Plumbaginaceae   | -                      | RR                   | I-II            | H       | A          | Rge-Site     | 0             | Hal-Psa     |
| Limonium     | lobatum       | Plumbaginaceae   | -                      | CC                   | I-III           | H       | A          | Rge-Sha-Site | 0             | Gly         |
| Limonium     | narbonense    | Plumbaginaceae   | -                      | R                    | I-II            | H       | P          | Slt          | 0             | Hal         |
| Limonium     | pruinosum     | Plumbaginaceae   | Molleih                | CC                   | I-III           | Fr      | P          | Rge-Sha-Site | 0             | Hal-SO4     |
| Limonium     | raddianum     | Plumbaginaceae   | -                      | R                    | I-II            | H       | P          | Slt          | 0             | Hal         |
| Limonium     | sinuatum      | Plumbaginaceae   | -                      | FC                   | I-III           | H       | A          | Rge-Sha-Site | 0             | Gly         |
| Limonium     | tubiflorum    | Plumbaginaceae   | Balman                 | C                    | I-III           | H       | P          | Rge-Sha-Site | 0             | Cha-Hal     |
| Limonium     | comosum       | Polygonaceae     | Artha                  | II-VI                | HS              | P       | Con-Dne    | Non          | 0             | Psa         |
| Emex         | spinosis      | Polygonaceae     | Dins el Aggooz         | CC                   | I-III           | H       | A          | Wld          | Unk           | Nit         |
| Fallopia     | convolvulus   | Polygonaceae     | -                      | R                    | I-II            | H       | A          | Cul          | Non           | 0           |
| Persicaria   | avicularia    | Polygonaceae     | Quordab                | R                    | I-II            | H       | P          | Wet          | Non           | 1           |
| Persicaria   | belardii      | Polygonaceae     | Quordab                | CC                   | I-II            | H       | A          | Wet          | Non           | 0           |
| Persicaria   | limbata       | Polygonaceae     | Quordab                | RR                   | I-II            | H       | P          | Wet          | Non           | 0           |
| Persicaria   | maculosa      | Polygonaceae     | Quordab                | R                    | I-II            | H       | A          | Wet          | Non           | 0           |
| Persicaria   | maritimum     | Polygonaceae     | Quordab                | FR                   | I               | Fr-DS   | P          | Coa-Dne      | Non           | Psa         |
| Persicaria   | plebeium      | Polygonaceae     | Quordab                | CC                   | I-II            | H       | P          | Wet          | Non           | 0           |
| Persicaria   | salicifolia   | Polygonaceae     | Quordab                | CC                   | I-II            | H       | P          | Wet          | Non           | 0           |
| Persicaria   | senegalensis  | Polygonaceae     | Quordab                | C                    | I-II            | H       | P          | Wet          | Non           | 0           |
| Polygonum    | equisetiforme | Polygonaceae     | Quordab                | FC                   | I-III           | Fr-DS   | P          | Rge-Site     | 3-4           | Psa         |
| Rumex        | cyprius       | Polygonaceae     | Khamsees               | C                    | I-II            | H       | A          | Wet          | Unk           | 2-3         |
| Rumex        | dentatus      | Polygonaceae     | Hommeld                | R                    | I-II            | H       | A          | Irr-Wet      | Unk           | Hyg-Wee     |
| Rumex        | pictus        | Polygonaceae     | Hommeld                | C                    | I-II            | H       | A          | Wet          | Unk           | 0           |
| Rumex        | vesicarius    | Polygonaceae     | Hambeit, Hummad        | FC                   | I-III           | H       | A          | Rge-Site     | Gra-Med-Veg   | Nit         |

| Genus        | Species                   | Family         | Vernacular name      | Frequency | Area of distribution | Biological type | Habitat | Utilization  | Grazing value | Remarks     |
|--------------|---------------------------|----------------|----------------------|-----------|----------------------|-----------------|---------|--------------|---------------|-------------|
| Eichornia    | crassipes                 | Pontederiaceae | Halassandi           | CC        | I-II                 | H               | Can-Fru | 0m           | 2             | Hyd-Nat-Wee |
| Portulaca    | oleracea                  | Portulacaceae  | Rigla, Rashad        | CC        | I-II                 | CH              | Wild    | Med-Veg      | 2             | Nit         |
| Posidonia    | oceânica                  | Posidoniaceae  | Shetenaara           | RR        | I                    | H               | P       | Non          | 0             | Hyd         |
| Angallis     | arvensis                  | Primulaceae    | Ebelia, Ayn al Gamal | CC        | I-III                | H               | A       | Cul-Wld      | 0             | Wee         |
| Asterolinon  | linum-stellatum           | Primulaceae    | -                    | RR        | I-II                 | H               | A       | Cul          | 0             | Wee         |
| Coris        | monspeliensis             | Primulaceae    | -                    | RR        | I-III                | CH              | P       | Rge-Site     | 0             | S04         |
| Samolus      | valerandi                 | Primulaceae    | Sboon Arab           | R         | I-II                 | H               | P       | Wet          | 0             | Hyg         |
| Adonis       | dentata                   | Ranunculaceae  | Nab el Gemi          | CC        | I-III                | H               | A       | Cul-Rge-Wld  | 1             | Psa-Tac     |
| Amaranthus   | blitoides                 | Ranunculaceae  | -                    | R         | I-II                 | H               | A       | Wild         | 0             | Wee         |
| Anemone      | coronaria                 | Ranunculaceae  | Zaghlel              | C         | I-II                 | H               | A       | Cul-Wld      | 0             | Wee         |
| Consolida    | flava                     | Ranunculaceae  | -                    | RR        | I-II                 | H               | A       | Cul-Rge-Wld  | 0             | Wee         |
| Delphinium   | bovei                     | Ranunculaceae  | -                    | RR        | I-II                 | H               | A       | Cul-Rge      | 0             | Psa         |
| Nigella      | arvensis subsp. taubertii | Ranunculaceae  | Karmoun Aswad        | R         | I-II                 | H               | A       | Cul          | 0             | Wee         |
| Nigella      | deserti                   | Ranunculaceae  | Zorbeb               | RR        | I-II                 | H               | A       | Cul-Wld      | 0             | End-Wee     |
| Ranunculus   | asiaticus                 | Ranunculaceae  | Shaqqeq              | C         | I-II                 | H               | A       | Cul-Wld      | 0             | Wee         |
| Ranunculus   | millefolius               | Ranunculaceae  | -                    | RR        | I-II                 | H               | P       | Fru          | 0             | Hyd         |
| Ranunculus   | muricatus                 | Ranunculaceae  | -                    | RR        | I-II                 | H               | A       | Fru          | 0             | Hyg         |
| Ranunculus   | petiatus                  | Ranunculaceae  | Zaghanta             | RR        | I-II                 | H               | A       | Wild         | 0             | Hyd         |
| Caylusea     | hexagyna                  | Resedaceae     | Denaaba              | FC        | I-II                 | H               | A       | Cul-Rge      | 1             | Tac-Wee     |
| Ochradenus   | baccatus                  | Resedaceae     | Qordi                | RR        | I-II                 | H               | P       | Des-Wld      | 1             | Psa         |
| Oligomeris   | limifolia                 | Resedaceae     | Denabban             | FC        | I-II                 | H               | A       | Fue-Gra      | 1-2           | Ere-Tac     |
| Randonia     | africana                  | Resedaceae     | -                    | FR        | I-II                 | DS              | P       | Des-Wld      | 1             | Ere         |
| Reseda       | alba                      | Resedaceae     | -                    | R         | I-II                 | H               | A       | Cul-Rge      | 1             | Wee         |
| Reseda       | arabica                   | Resedaceae     | Deil                 | CC        | I-III                | H               | A       | Cul-Rge-Site | 1             | Tac-Wee     |
| Reseda       | decurviva                 | Resedaceae     | Rigl Gorab           | CC        | I-III                | H               | A-B     | Cul-Rge-Site | 1             | Psa         |
| Reseda       | lutea                     | Resedaceae     | Weyna                | RR        | I-III                | H               | A       | Cul-Rge      | 2-3           | Wee         |
| Reseda       | luteola                   | Resedaceae     | Baqm, Bli ha         | R         | I-III                | H               | A       | Cul-Rge      | 1             | Wee         |
| Reseda       | orientalis                | Resedaceae     | Deil                 | RR        | I-III                | H               | A       | Cul-Rge      | 1             | Wee         |
| Reseda       | phytisma                  | Resedaceae     | -                    | RR        | I-II                 | H               | A       | Cul-Rge      | 1             | Wee         |
| Reseda       | pruinosa                  | Resedaceae     | Denaaba              | CC        | I-II                 | H               | A       | Cul-Rge      | 1             | Wee         |
| Reseda       | urnigera                  | Resedaceae     | -                    | R         | I-III                | H               | A       | Cul-Rge      | 1             | Wee         |
| Rhamnus      | oleoides                  | Rhamnaceae     | Safdufa              | RR        | I-II                 | HS              | P       | Fru-Gra      | 3-4           | Chi         |
| Ziziphus     | lotus                     | Rhamnaceae     | Sidra                | RR        | I-II                 | HS              | P       | Cli-Wld      | 2             | Phr         |
| Ziziphus     | spina-christi             | Rhamnaceae     | Nabq, Zegzeg         | RR        | I-IV                 | T               | P       | Des-Wld      | 2             | Phr         |
| Rubus        | sanctus                   | Rosaceae       | Ward Barrir          | I-II      | CI                   | P               | Wild    | Non          | 0             | Nit         |
| Sanguisorba  | minor                     | Rubiaceae      | Abu Greisaf          | R         | I-II                 | H               | P       | Cul-Rge      | 3-4           | Wee         |
| Calypeltis   | cucullaris                | Rubiaceae      | Baseesa              | FR        | I-II                 | H               | A       | Cli-Roc      | 0             | Cha-Nit     |
| Cruciariella | aegyptiaca                | Rubiaceae      | -                    | C         | I-II                 | H               | P       | Cul          | 0             | Psa         |
| Cruciariella | maritima                  | Rubiaceae      | -                    | C         | I                    | Fr              | P       | Coa-Snd      | 0             | Psa         |
| Galium       | canum                     | Rubiaceae      | -                    | RR        | I-II                 | H               | P       | Cul          | 0             | Wee         |

| Genus       | Species         | Vernacular name  | Family        | Frequency | Area of distribution | Biological type | Life span | Habitat     | Utilization | Grazing value | Remarks |
|-------------|-----------------|------------------|---------------|-----------|----------------------|-----------------|-----------|-------------|-------------|---------------|---------|
| Gallium     | murale          | Rubiaceae        | -             | RR        | I-II                 | Cul             | A         | Non         | 0           | Wee           |         |
| Gallium     | tricornutum     | Rubiaceae        | -             | C         | I-II                 | Cul             | A         | Non         | 0           | Wee           |         |
| Gallium     | hispidia        | Rubiaceae        | -             | FR        | I-II                 | A               | Roc       | Non         | 0           | Cha           |         |
| Valantia    | cirrhosa        | Ruppia           | -             | RR        | I-II                 | H               | P         | Sea-Bra     | 0           | Hyd           |         |
| Ruppia      | maritima        | Ruppia           | -             | RR        | I-II                 | H               | P         | Sea-Bra     | 0           | Hyd           |         |
| Ruppia      | subserata       | Salicaceae       | R             | I-II      | HS-T                 | P               | Wet       | Orn         | 1           | Hyg           |         |
| Salix       | tetrasperma     | Salicaceae       | R             | I-II      | HS-T                 | P               | Wet       | Fue         | 1           | Hyg           |         |
| Salix       | humile          | Santalaceae      | Hab el Kreish | I-II      | H-Par                | A               | Cul-Rge   | Unk         | 0           | Wee           |         |
| Theesium    | orontium        | Scrophulariaceae | Saysam        | C         | I-II                 | A               | Cul-Rge   | Gra         | 2           | Psa           |         |
| Antirrhinum | aegyptiacum     | Scrophulariaceae | Thal el Fahr  | CC        | I-II                 | Fr              | P         | Rge-Sha-Ste | 2           | Psa           |         |
| Kickxia     | elatine         | Scrophulariaceae | -             | C         | I-II                 | H               | A         | Cul-Rge     | 1           | Psa           |         |
| Kickxia     | albifrons       | Scrophulariaceae | -             | FC        | I-II                 | H               | P         | Cul         | 0           | Wee           |         |
| Chalepensis | chalepensis     | Scrophulariaceae | -             | RR        | I-II                 | H               | A         | Cul         | 0           | Wee           |         |
| Linaria     | haeleva         | Scrophulariaceae | Halawa        | C         | I-II                 | H               | A         | Cul-Rge     | 1           | Wee           |         |
| Linaria     | micrantha       | Scrophulariaceae | -             | RR        | I-II                 | H               | A         | Cul         | 0           | Wee           |         |
| Linaria     | camina          | Scrophulariaceae | Qarsa         | FR        | I-III                | Fr              | P         | Rge-Snd     | 0           | Psa           |         |
| Striga      | asiatica        | Scrophulariaceae | Odaar         | RR        | I-II                 | Par             | A         | Cul-Irr     | 0           | Wee           |         |
| Verbascum   | lebourneuxii    | Scrophulariaceae | -             | FC        | I-II                 | Fr              | P         | Rge-Sha     | 0           | End           |         |
| Veronica    | persica         | Scrophulariaceae | -             | RR        | I-II                 | H               | A         | Cul         | 0           | Wee           |         |
| Veronica    | polita          | Scrophulariaceae | -             | FC        | I-II                 | H               | A         | Cul         | 0           | Wee           |         |
| Veronica    | syriaca         | Scrophulariaceae | -             | RR        | I-II                 | H               | A         | Cul         | 0           | Wee           |         |
| Datura      | metel           | Solanaceae       | -             | R         | I-II                 | H               | A         | Wild        | T           | Nit           |         |
| Datura      | stramonium      | Solanaceae       | Semmel Fahr   | R         | I-II                 | H               | A         | Wild        | T           | Nit           |         |
| Datura      | albus           | Solanaceae       | Bing          | FC        | I-II                 | H               | P         | Wild        | T           | Nit           |         |
|             | muticus         | Solanaceae       | Sakaraan      | FC        | I-V                  | H               | P         | Wild-Wid    | Med         | T             | Ere-Pel |
|             | aschersonii     | Solanaceae       | Awsaj.        | R         | I-II                 | HS              | P         | Wild        | Fen-Fue     | 0             | S04     |
|             | barbarum        | Solanaceae       | Awsaj.        | C         | I-II                 | HS              | P         | Rge-Wad     | Fue-Gra     | 1             | S04     |
|             | europeum        | Solanaceae       | Awsaj.        | R         | I-II                 | HS              | P         | Wild        | Fen-Fue     | 1             | S04     |
|             | schweinfurthii  | Solanaceae       | Awsaj.        | R         | I-II                 | HS              | P         | Wild        | Fen-Fue     | 0             | S04     |
|             | shawii          | Solanaceae       | Awsaj.        | CC        | I-III                | HS              | P         | Rge-Wad     | Fue-Gra-Med | 1             | S04     |
|             | glauca          | Solanaceae       | Massasa       | CC        | I-II                 | HS              | P         | Wild        | Med         | T             | Nat-Nit |
|             | nigrum          | Solanaceae       | Anab al dib   | R         | I-II                 | H               | A         | Wild        | Non         | T             | Nit     |
|             | hirtella        | Tamaricaceae     | Molleih       | CC        | I-II                 | Fr              | P         | Rge-Sha-Ste | Gra         | 2             | Hal-S04 |
|             | vermiculata     | Tamaricaceae     | Molleih       | R         | I-III                | Fr              | P         | Rge-Sha-Ste | Gra         | 1-2           | Hal-S04 |
|             | aphylla         | Tamaricaceae     | Ethel         | C         | I-V                  | T               | P         | Des-Wad     | Fue         | 0             | Phr     |
|             | nibotica        | Tamaricaceae     | Moor          | CC        | I-V                  | HS              | P         | Slt         | Fue         | 0             | Hal-Phr |
|             | passerinaeoides | Tamaricaceae     | -             | C         | I-IV                 | HS              | P         | Wad         | Fue         | 0             | Hal-Phr |
|             | tetragyna       | Tamaricaceae     | Tarfa         | C         | I-V                  | HS              | P         | Slt         | Fue         | 0             | Hal-Phr |
|             | hirnsuta        | Thymelaeaceae    | Mitrana       | CC        | I-III                | HS              | P         | Rge-Wld     | Fue-Han-Med | T             | Psa     |
|             | olitorius       | Tiliaceae        | Melokhyia     | CC        | I-III                | H               | A         |             | Gra-Veg     | 0             |         |

| Genus                | Species               | Family       | Vernacular name  | Frequency | Area of distribution | Biological type | Habitat | Life span   | Utilization | Grazing value | Remarks     |
|----------------------|-----------------------|--------------|------------------|-----------|----------------------|-----------------|---------|-------------|-------------|---------------|-------------|
| <i>Typha</i>         | <i>domingensis</i>    | Typhaceae    | Typhaceae        | CC        | I-II                 | H               | Can-Fw  | P           | Han         | 0             | Hyd-Hyg     |
| <i>Ammi</i>          | <i>majus</i>          | Umbelliferae | Khilla Baladi    | C         | I-II                 | H               | Cult    | Med         | Med         | 0             | Pel-Sil-Wee |
| <i>Ammi</i>          | <i>visnaga</i>        | Umbelliferae | Khilla shiteiani | R         | I-II                 | H               | A       | Wet-Wld     | Med         | T             | Hyg-Pel     |
| <i>Apium</i>         | <i>crassipes</i>      | Umbelliferae | -                | RR        | I-II                 | H               | A       | Cult        | Non         | 0             | Wee         |
| <i>Apium</i>         | <i>graveolens</i>     | Umbelliferae | Karafs           | CC        | I-II                 | H               | A       | Cult        | Non         | 0             | Wee         |
| <i>Apium</i>         | <i>leptophyllum</i>   | Umbelliferae | -                | FC        | I-II                 | H               | A       | Cult        | Non         | 0             | Wee         |
| <i>Apium</i>         | <i>nodiforum</i>      | Umbelliferae | -                | R         | I-II                 | H               | P       | Wet         | Non         | 0             | Hyg         |
| <i>Brachyapium</i>   | <i>dichotomum</i>     | Umbelliferae | -                | RR        | I-II                 | H               | A       | Cult        | Non         | 0             | Wee         |
| <i>Bupleurum</i>     | <i>lancifolium</i>    | Umbelliferae | Halawaan         | C         | I-II                 | H               | A       | Cult        | Non         | 0             | Pel-Wee     |
| <i>Bupleurum</i>     | <i>nanum</i>          | Umbelliferae | -                | R         | I-II                 | H               | A       | Cult        | Non         | 0             | Wee         |
| <i>Bupleurum</i>     | <i>nodiforum</i>      | Umbelliferae | -                | R         | I-II                 | H               | A       | Cult        | Non         | 0             | Pel-Wee     |
| <i>Bupleurum</i>     | <i>semicompositum</i> | Umbelliferae | -                | FC        | I-II                 | H               | A       | Cul-Wld     | Non         | 0             | Hal-Pel     |
| <i>Bupleurum</i>     | <i>sativum</i>        | Umbelliferae | Kozbara          | C         | I-II                 | H               | A       | Cult        | Non         | 0             | Wee         |
| <i>Bupleurum</i>     | <i>maritimum</i>      | Umbelliferae | -                | RR        | I                    | C-Fr            | P       | Roc         | Med         | 0             | Cha         |
| <i>Bupleurum</i>     | <i>guttatus</i>       | Umbelliferae | Shamarel Gemel   | R         | I-II                 | H               | A       | Cult        | Non         | 0             | Wee         |
| <i>Bupleurum</i>     | <i>litoralis</i>      | Umbelliferae | -                | CC        | I-II                 | H               | A       | Cul-Wld     | Non         | 0             | Wee         |
| <i>Daucus</i>        | <i>syriacus</i>       | Umbelliferae | Gezzah           | CC        | I-II                 | H               | A       | Cul-Rge     | Gra         | 2             | Psa-Tac     |
| <i>Daucus</i>        | <i>tortuosa</i>       | Umbelliferae | Shamarel Gemel   | CC        | I-IV                 | DS              | P       | Cul-Rge     | Gra-Med     | 2-3           | Psa         |
| <i>Daucus</i>        | <i>campestre</i>      | Umbelliferae | Qezzah           | C         | I-II                 | H               | P       | Cul-Rge-Ste | Med         | 0             | Pel-Sil     |
| <i>Daucus</i>        | <i>creticum</i>       | Umbelliferae | Shaqaqool        | R         | I-II                 | H               | P       | Cul-Rge     | Non         | 0             | Pel-Sil-Wee |
| <i>Daucus</i>        | <i>marmorata</i>      | Umbelliferae | Felkh            | RR        | I-II                 | H               | P       | Sha-Ste     | Non         | T             | End         |
| <i>Deverra</i>       |                       | Umbelliferae | Tel ghoudi       | FC        | I-II                 | H               | P       | Cul-Rge     | Non         | 0             | Wee         |
| <i>Eryngium</i>      |                       | Umbelliferae | -                | RR        | I-II                 | H               | P       | Wet         | Non         | 0             | Hyg         |
| <i>Eryngium</i>      |                       | Umbelliferae | Misheita         | C         | I-II                 | H               | A       | Cul         | Non         | 0             | Psa-Tac     |
| <i>Ferula</i>        |                       | Umbelliferae | Shamarel Gemel   | C         | I-II                 | H               | A       | Coa-Snd     | Non         | 0             | Wee         |
| <i>Malabaila</i>     |                       | Umbelliferae | -                | RR        | I-II                 | H               | A       | Cul         | Non         | 0             | Wee         |
| <i>Petroselinum</i>  |                       | Umbelliferae | Misheita         | C         | I-II                 | H               | A       | Cul         | Non         | 0             | Wee         |
| <i>Pseudodollaya</i> |                       | Umbelliferae | Shamarel Gemel   | R         | I-II                 | H               | A       | Cul         | Non         | 0             | Wee         |
| <i>Scandix</i>       |                       | Umbelliferae | -                | RR        | I-II                 | H               | A       | Cul         | Non         | 0             | Wee         |
| <i>Tordylium</i>     |                       | Umbelliferae | Shamarel Gemel   | R         | I-II                 | H               | A       | Cul         | Non         | 0             | Wee         |
| <i>Torilis</i>       |                       | Umbelliferae | -                | R         | I-II                 | H               | P       | Cul         | Non         | 0             | Wee         |
| <i>Torilis</i>       |                       | Umbelliferae | Shamarel Gemel   | CC        | I-II                 | H               | A       | Cul-Wld     | Non         | 0             | Sil-Wee     |
| <i>Torilis</i>       |                       | Umbelliferae | Ghazzar Frangi   | R         | I-II                 | H               | A       | Cul         | Non         | 0             | Wee         |
| <i>Torilis</i>       |                       | Umbelliferae | Shamarel Gemel   | R         | I-II                 | H               | A       | Cul         | Non         | 0             | Wee         |
| <i>Parietaria</i>    |                       | Urticaceae   | Wideln           | FC        | I-II                 | H               | A       | Wild        | Med         | 0             | Nit         |
| <i>Parietaria</i>    |                       | Urticaceae   | Qoreis           | R         | I-II                 | H               | A       | Roc         | Med         | 0             | Nit         |
| <i>Urtica</i>        |                       | Urticaceae   | Qoreis, Hurreq   | FC        | I-II                 | H               | A       | Wild        | Med         | 0             | Nit         |
| <i>Urtica</i>        |                       | Urticaceae   | Valerianacea     | RR        | I-II                 | H               | A       | Rge-Wld     | Med         | 0             | Nit         |
| <i>Valerianella</i>  | <i>discoidea</i>      | Valerianacea | Gesseima         | RR        | I-II                 | H               | A       | Cul-Wld     | Gra         | 1             | Wee         |
| <i>Valerianella</i>  | <i>petrovitchii</i>   | Valerianacea | Gesseima         | RR        | I-II                 | H               | A       | Cul-Wld     | Gra         | 1             | Wee         |
| <i>Phyla</i>         | <i>nodiflora</i>      | Verbenacea   | Libya            | FC        | I-II                 | H               | P       | Wad-Wet     | Gra         | 1             | Hyg         |
| <i>Verbenae</i>      | <i>officinalis</i>    | Verbenacea   | Rig al Hammam    | FR        | I-II                 | H               | P       | Cul         | Med-Veg     | 0             | Hyg         |
| <i>Verbenae</i>      | <i>supina</i>         | Verbenacea   | Morreig          | FC        | I-II                 | H               | A       | Wad         | Gra         | 1             | Hyg         |

| Genus               | Species            | Family           | Vernacular name | Frequency | Area of distribution | Biological type | Life span | Habitat     | Utilization | Grazing value | Remarks |
|---------------------|--------------------|------------------|-----------------|-----------|----------------------|-----------------|-----------|-------------|-------------|---------------|---------|
| <i>Viola</i>        | <i>scorpioides</i> | Violaceae        | —               | FR        | I-II                 | Fr              | P         | Cli         | Gra         | 1             | Cha-End |
| <i>Zannichellia</i> | <i>punctata</i>    | Zannichelliaceae | Lahm el Naga    | CC        | I-II                 | H               | P         | Can-Frw     | Non         | 0             | Hyd     |
| <i>Zostera</i>      | <i>nottii</i>      | Zosteraceae      | Hamool          | RR        | I                    | H               | P         | Sea         | Non         | 0             | Hyd     |
| <i>Fragaria</i>     | <i>arabica</i>     | Zygophyllaceae   | —               | FR        | III-VI               | Fr              | P         | Des-Rge     | Non         | 0             | Psa     |
| <i>Fragaria</i>     | <i>bruguieri</i>   | Zygophyllaceae   | Hallawa         | FR        | II-VI                | Fr              | P         | Des-Rge     | Non         | 0             | Psa-Tac |
| <i>Fragaria</i>     | <i>cretica</i>     | Zygophyllaceae   | Hallawa         | C         | I-III                | Fr              | P         | Cli-Roc-Run | Non         | 0             | Cha     |
| <i>Fragaria</i>     | <i>glutinosa</i>   | Zygophyllaceae   | Hallawa         | FC        | II-V                 | Fr              | P         | Rge-Sle     | Non         | 0             | Psa     |
| <i>Nitaria</i>      | <i>retusa</i>      | Zygophyllaceae   | Ghardaq         | FC        | I-III                | TS              | P         | Rge-Wld     | Fue-Gra     | 1             | Phr-SO4 |
| <i>Peganum</i>      | <i>harmala</i>     | Zygophyllaceae   | Harmel          | CC        | I-III                | H               | P         | Rge-Sle-Wld | Non         | T             | Nit     |
| <i>Teredilis</i>    | <i>terrella</i>    | Zygophyllaceae   | —               | RR        | I-III                | H               | A         | Slt         | Non         | 0             | Hal     |
| <i>Tribulus</i>     | <i>terestris</i>   | Zygophyllaceae   | Shiq Shiq       | CC        | I-III                | H               | A         | Rge-Wld     | Non         | 0             | Psa-Tac |
| <i>Zygophyllum</i>  | <i>aegyptium</i>   | Zygophyllaceae   | Belbel          | R         | II-IV                | Fr              | P         | Rge-Slt     | Non         | 0             | End     |
| <i>Zygophyllum</i>  | <i>album</i>       | Zygophyllaceae   | Belbel          | CC        | I-VI                 | CS              | P         | Rge-Wld     | Non         | 0             | Hal-SO4 |
| <i>Zygophyllum</i>  | <i>coccineum</i>   | Zygophyllaceae   | Qarlam          | FC        | III-VI               | CS              | P         | Des-Wad     | Non         | 0             | Pel     |
| <i>Zygophyllum</i>  | <i>gestini</i>     | Zygophyllaceae   | Belbel          | C         | I-VI                 | CS              | P         | Wld         | Non         | 0             | Hal-SO4 |



Map 1. – Map of the Marmarica.