

# Studies on the flora of Jordan : 5. On the flora of El Jafr-Bayir Desert

Autor(en): **Boulos, Loutfy**

Objektyp: **Article**

Zeitschrift: **Candollea : journal international de botanique systématique = international journal of systematic botany**

Band (Jahr): **32 (1977)**

Heft 1

PDF erstellt am: **22.06.2024**

Persistenter Link: <https://doi.org/10.5169/seals-880221>

## **Nutzungsbedingungen**

Die ETH-Bibliothek ist Anbieterin der digitalisierten Zeitschriften. Sie besitzt keine Urheberrechte an den Inhalten der Zeitschriften. Die Rechte liegen in der Regel bei den Herausgebern.

Die auf der Plattform e-periodica veröffentlichten Dokumente stehen für nicht-kommerzielle Zwecke in Lehre und Forschung sowie für die private Nutzung frei zur Verfügung. Einzelne Dateien oder Ausdrucke aus diesem Angebot können zusammen mit diesen Nutzungsbedingungen und den korrekten Herkunftsbezeichnungen weitergegeben werden.

Das Veröffentlichen von Bildern in Print- und Online-Publikationen ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Die systematische Speicherung von Teilen des elektronischen Angebots auf anderen Servern bedarf ebenfalls des schriftlichen Einverständnisses der Rechteinhaber.

## **Haftungsausschluss**

Alle Angaben erfolgen ohne Gewähr für Vollständigkeit oder Richtigkeit. Es wird keine Haftung übernommen für Schäden durch die Verwendung von Informationen aus diesem Online-Angebot oder durch das Fehlen von Informationen. Dies gilt auch für Inhalte Dritter, die über dieses Angebot zugänglich sind.

## Studies on the flora of Jordan 5. On the flora of El Jafr—Bayir Desert

LOUTFY BOULOS

### Résumé

Boulos, L. (1977). Etude de la flore de Jordanie 5. Flore du désert entre El Jafr et Bayir. *Candollea* 32: 99-110. En anglais.

L'auteur énumère 141 espèces de plantes à fleurs récoltées en avril 1975 et en mai 1976 entre El Jafr et Bayir, en donnant pour certaines leur nom vernaculaire et leur usage local. Des remarques occasionnelles d'écologie, de phénologie et distribution sont ajoutées et la combinaison nouvelle *Arnebia macrocalyx* (*Boraginaceae*) est validée.

### Abstract

Boulos, L. (1977). Studies on the flora of Jordan 5. On the flora of El Jafr—Bayir Desert. *Candollea* 32: 99-110. French abstract.

The author enumerates 141 species of flowering plants collected in April 1975 and May 1976 in the area between El Jafr and Bayir. Vernacular names and local uses of some species are given, and occasional notes on the ecology, phenology and distribution are added. The new combination *Arnebia macrocalyx* (*Boraginaceae*) is validated.

Boulos & Jallad (1975) drew attention to the desert between El Jafr and Bayir as one of those areas that are rarely visited by botanists, or have never even been explored botanically.

Our area is a hummocky desert plateau: the altitude at El Jafr is 865 m above sea level, and at Bayir about 930 m. The main wadis are Wadi Shaumari and Wadi Bayir. Wadi Shaumari starts upstream at Jabal Shaumari and flows southward downstream to end at Qa'a El Jafr. Several affluents of the wadi flow northwest. Wadi Bayir begins upstream in the hilly country west of Bayir and runs N.N.E. into a depression outside our area called Wadi Sirhan (see map, fig. 1).

Meteorological data are only available for El Jafr, where the mean annual rainfall is 35.6 mm. The highest observed rainfall in 24 hours was 29.5 mm (February 1975). The mean maximum air temperature is 35.4°C, in July; and the mean minimum air temperature is -0.2°C, in January.

El Jafr Basin is a syncline-like depression within the relatively stable zone surrounding the Arabian Shield. The topmost strata of the basin are built up of

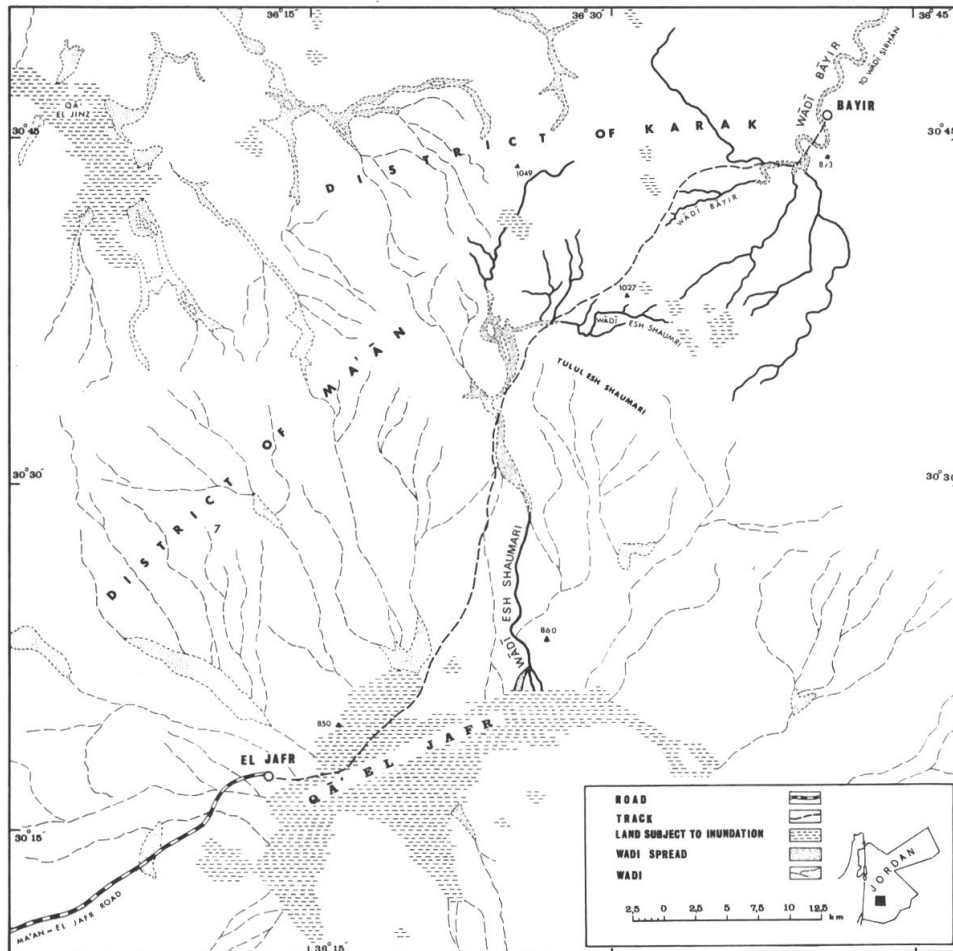


Fig. 1. – Map of the desert area between El Jafr and Bayir.

interbedded fluvial gravels and lacustrine limestone and clays. These, as well as wadi sediments, chert pavements (Hammada), and pelitic sediments, were deposited after the Pliocene regression. The central part of the basin was flooded during the Pleistocene by freshwater, which later gave rise to lacustrine deposits.

The Bayir Block is built up to Tertiary sediments consisting of limestone with chert beds, marls, and locally nummulitic limestones. Since their deposition, these sediments have been exposed to prolonged exfoliation (temperature weathering) and to minor erosion due to low precipitation.

Owing to high evaporation rates in both El Jafr and Bayir, the winter rains fail to reach the groundwater table, but are retained in the subsoil, then raised to the surface by capillarity during the hot summer.

The present study is based on two Spring visits to the area, during April 1975 and May 1976. The first visit was made about two months after the exceptionally good rain of February 1975, which is considered an observed maximum (29.5 mm

in 24 hours). In consequence, the ephemeral vegetation was rich, and the perennials were flourishing. On the other hand, during the second visit of 1-2 May 1976, the annuals were extremely poor as to the number of species, vigour of specimens, and the percentage they contributed to the plant cover of the area in general. For example: *Diploaxis villosa* Boulos & Jallad, which was described from the collections of April 1975, was observed in many patches, each of which covered hundreds of square metres and formed pure stands, or was associated with other species, mainly annuals. Generally, the plant cover approached 100% in many areas. On the other hand, only a few patches with a small number of plants were observed on 1 May 1976. The specimens were not more than 15 cm high, in contrast to those of the previous year, which reached 60 cm in height. It is well known, however, that these dramatic season-to-season changes in the plant cover, especially those that occur during spring and early summer, are a result of the erratic winter rains that characterize areas where this type of desert vegetation is found.

During both seasons, 276 numbers were collected. These comprise 34 families, including 141 species and 1 variety. The largest family is *Compositae*, represented by 30 species. Next are: *Chenopodiaceae*, 13 species; *Cruciferae*, 13 species; *Leguminosae*, 11 species; *Gramineae*, 9 species and *Boraginaceae*, 7 species.

The following is a list of the localities from which collections were made:<sup>1</sup>

- 7894-7933: El Jafr, in the vicinity of the Police Station, 9.4.1975, *B.* & *J.*  
 7934-7943: 17 km N. of El Jafr, 9.4.1975, *B.* & *J.*  
 7944-7997: c. 40 km N.E. of El Jafr, 9.4.1975, *B.* & *J.*  
 7998-7999: Bayir, 9.4.1975, *M.*  
 8000-8002: 7 km S.W. of El Jafr, along the road to Ma'an, 9.4.1975, *B.* & *J.*  
 8584-8602: Wadi Abu Khasharef, 2 km from El Jafr, along the road to Ma'an, 1.5.1976, *B.*, *A.* & *Q.*  
 8603-8623: Wadi Shaumari, downstream, 35 km N.E. of El Jafr, 910 m, 1.5.1976, *B.*, *A.* & *Q.*  
 8624-8629: Wadi Shaumari, upstream, 44 km N.E. of El Jafr, 1000 m, 1.5.1976, *B.*, *A.* & *Q.*  
 8630-8640: 22 km S.W. of Bayir, 1060 m, 1.5.1976, *B.*, *A.* & *Q.*  
 8641-8652: 14 km S. of Bayir, 950 m, 1.5.1976, *B.*, *A.* & *Q.*  
 8653-8677: Wadi, 8 km S.W. of Bayir Police Station, 920 m, 1.5.1976, *B.*, *A.* & *Q.*  
 8678-8682: Wadi Bayir, 1.5 km below Bayir Police Station, 900 m, 1.5.1976, *B.*, *A.* & *Q.*  
 8683-8725: Wadi Bayir, 1 km below Bayir Police Station, 900 m, 2.5.1976, *B.*, *A.* & *Q.*

<sup>1</sup>Collectors' names are abbreviated as follows: *A.* = D. Addis; *B.* = L. Boulos; *J.* = W. Jallad; *M.* = N. Mohamed; *Q.* = M. Qumsiyeh.

8726-8750: affluent to Wadi Bayir, flowing east-west, 5 km W. of Bayir Police station, 900-960 m, 2.5.1976, *B.*, *A.* & *Q.*

Specimens of the above-mentioned collections are deposited in the Herbarium, Faculty of Science, University of Jordan, Amman, Jordan. Duplicates were distributed to the following herbaria: B, BR, CAI, G and K. The following is an alphabetically arranged list of the families, with the genera and species related to them. The numbers refer to the localities from which the specimens were collected. The abbreviations used in the text are:

fl. = flowering specimen  
fr. = fruiting specimen  
ster. = sterile specimen, without flowers or fruits.

*Aizoaceae*

*Aizoon hispanicum* L.

7988 (fl., fr.).

*Mesembryanthemum nodiflorum* L.

8709 (ster.).

*Alliaceae*

*Allium sindjarense* Boiss. & Hausskn.  
ex Regel

7948 (fl., fr.).

*Amaranthaceae*

*Amaranthus graecizans* L.

8590 (ster.). Young plants are somewhat palatable to sheep.

*Boraginaceae*

*Arnebia decumbens* (Vent.) Cosson & Kralik, Bull. Soc. Bot. France 4: 398, 402. 1857.

= *A. decumbens* (Vent.) Cosson & Kralik var. *microcalyx* Cosson & Kralik, Bull. Soc. Bot. France 4: 402. 1857, *nom. illeg.* (cit. *typus Ventenatii*).

= *Lithospermum decumbens* Vent., Descr. Pl. Jard. Cels: tab. 37, 1801.

8664 (fl., fr.).

*Arnebia linearifolia* DC.

7945 (fl., fr.).

*Arnebia macrocalyx* (Cosson & Kralik) Boulos, *comb. & stat. nov.*

*Basionym:* *Arnebia decumbens* var. *macrocalyx* Cosson & Kralik, Bull. Soc. Bot. France 4: 403. 1857.

7997 (fl., fr.).

The above 3 species of *Arnebia* Forsskål, were previously treated as 2 species: *Arnebia linearifolia* and *A. decumbens*, the latter with 2 varieties. Boissier (1879: 214), already pointed out that *Arnebia cornuta* Ledeb. (synonym to *A. decumbens*) seems to be a quite distinct species; the taxon that was previously treated as var. *macrocalyx* is indeed more closely related morphologically to *A. linearifolia* than to var. *microcalyx*. Moreover, the use of the infraspecific epithet "microcalyx" is illegitimate, and the name *Arnebia decumbens* must be retained.

*Gastrocotyle hispida* (Forsskål) Bunge

7961 (fl., fr.).

*Heliotropium ramosissimum* (Lehm.) DC.

8002 (fl.) – 8720 (fl., fr.). Flowers white.

**Lappula spinocarpos** (Forsskål) Ascher-  
son ex Kuntze

7912 (fl., fr.) – 8661 (fl., fr.) –  
8685 (fl., fr.).

**Paracaryum rugulosum** (DC.) Boiss.

7999 (fl., fr.) – 8623 (fl., fr.) –  
8718 (fl., fr.).

*Capparaceae*

**Capparis leucophylla** DC.

7933 (fl., fr.) – 8602 (fl.).

*Caryophyllaceae*

**Gypsophila arabica** Barkoudah

7944 (fl.) – 8617 (fl.) – 8629 (fl.)  
– 8682 (fl.) – 8713 (fl.) – 8732 (fl.).

**Herniaria hirsuta** L.

7978 (fl.).

**Paronychia sinaica** Fresen.

8698 (fl.). Common in the wadi bed  
between stones.

**Pteranthus dichotomus** Forsskål

7970 (fl., fr.) – 8610 (fl.) – 8666  
(fl.).

**Spergularia diandra** (Guss.) Boiss.

7913 (fl., fr.) – 7964 (fl., fr.) –  
8684 (fl., fr.).

*Chenopodiaceae*

**Anabasis articulata** (Forsskål) Moq.

7943 (ster.).

**Anabasis syriaca** Iljin (local name:  
'Odw **عشو**)

8586 (ster.). Dried branches are  
used by Bedouins as a substitute for  
soap in washing clothes.

**Atriplex halimus** L. (local name: Qataf  
**قطف**)

8596 (ster.) – 8743 (ster.).

**Atriplex stylosa** Viv. (local name:  
Roghol **رغل**)

8619 (ster.) – 8631 (ster.).

**Atriplex tatarica** L.

7920 (ster.).

**Halocharis** sp.

7905 (ster.).

**Halogeton alopecuroides** (Delile) Moq.  
= *Agatophora alopecuroides* (Delile)  
Bunge

7966 (ster.) – 8626 (ster.).

**Haloxylon salicornicum** (Moq.) Bunge

7992 (ster.).

**Haloxylon scoparium** Pomel  
= *H. articulatum*, *nom. illeg.*

8624 (ster.). The plant was observed  
to be a host for *Cistanche tubulosa*.

**Salsola glauca** M.B.

7962 (fl.).

**Salsola tetrandra** Forsskål

8633 (ster.) – 8635 (fl.) – 8749  
(fl.). The first 2 numbers belong to  
the same locality. However the first  
is sterile, with juvenile branches, longer  
internodes, and less hairs than the  
second.

**Salsola vermiculata** L. var. *villosa* (De-  
lile ex Roemer & Schultes) Moq.

8667 (ster.).

**Seidlitzia rosmarinus** (Ehrenb.) Bunge

8000 (ster.) – 8598 (ster.).

*Cistaceae*

**Helianthemum lippii** (L.) Dum.-Courset  
7939 (fl.) – 8715 (fl., fr.).

*Cleomaceae*

**Cleome amblyocarpa** Barratte & Murb.  
8584 (fl., fr.). For synonyms and literature, see Hedge & Lamond (1970).

*Compositae*

**Aaronsohnia faktorovskyi** Warburg & Eig  
7906 (fl.).

**Achillea fragrantissima** (Forsskål) Schultz Bip. (local name: Geisoum (شيصوم))  
7921 (ster.) – 8600 (ster.). Plant palatable to livestock.

**Anthemis deserti** Boiss.  
7955 (fl.).

**Anthemis melampodina** Delile (local name: Erbian (اربيان))  
8620 (fl.).

**Anthemis pseudocotula** Boiss.  
7899 (fl., fr.).

**Anthemis** sp.  
7895 (fl.).

**Artemisia inculta** Delile (local name: Sheih (شيه))  
= *A. herba-alba* Asso  
7930 (fl.) – 8613 (ster.) – 8733 (fl.). Palatable to camels and sheep; added to ghee (boiled butter) for its preservation; useful for intestinal troubles.

**Asteriscus graveolens** Less. (local name: Noqod (نقود))  
7925 (fl.) – 8618 (fl.) – 8648 (fl.) – 8724 (fl.) – 8742 (fl., fr.).

**Astropterus leyseroides** (Desf.) Rothm.  
8701 (fl., fr.).

**Atractylis carduus** (Forsskål) C. Chr. = *A. flava* Desf.  
7976 (fl.) – 8608 (fl.). Palatable to sheep and camels.

**Atractylis mutica** C. C. Townsend  
8745 (young fl., dry old fr.).

**Calendula arvensis** L.  
8643 (fl.) – 8662 (fl., fr.) – 8690 (fl., fr.).

**Carduus pycnocephalus** L.  
8638 (fl.).

**Centaurea pallescens** Delile (local name: Mararah (مرارة))  
7918 (fl.) – 7989 (fl.) – 8606 (fl.) – 8644 (fl.).

**Centaurea scoparia** Sieb.  
8659 (fl.).

**Filago desertorum** Pomel  
7902 (fl., fr.) – 7977 (fl., fr.).

**Francoeuria crispa** (Forsskål) Cass. (local name: Gathian (جثيان))  
= *Pulicaria crispa* (Forsskål) Bentham & Hooker fil.  
8585 (ster.).

**Gymnarrhena micrantha** Desf. (local name: Khoff El-Kaleb (خف الكلب))  
7963 (fl., fr.).

**Lactuca undulata** Ledeb.

8646 (fl.).

**Lasiopogon muscoides** (Desf.) DC.

7968 (fl., fr.).

**Launaea nudicaulis** (L.) Hooker fil.  
(local name: Howwa حووة)

7901 (fl., fr.) – 7940 (fl., fr.) – 8593 (fl.) – 8622 (fl.) – 8652 (fl.) – 8711 (fl., fr.). Plant eaten as a green salad.

**Leontodon laciniatus** (Bertol.) Widder

7990 (fl., fr.).

**Matricaria aurea** (Loefl.) Schultz Bip.

7969 (fl.).

**Phagnalon rupestre** (L.) DC.

8721 (fl., fr.) – 8737 and 8739 (fl., fr.). The last 2 numbers represent shade and normal forms growing in the same locality. The shade form has much broader and larger leaves, being sheltered under an eroded limestone shelf toward the uppermost part of the wadi near the plateau. The normal form possesses the usual reduced leaves and is abundant between rocks in the wadi bed.

**Picris babylonica** Hand.-Mazz.

8665 (fl.).

**Picris longirostris** Schultz Bip.= *P. damascena* Boiss. & Gaill.; *P. blancheana* Boiss.; *P. desertorum* Nábelék

7973 (fl., fr.).

**Scariola orientalis** (Boiss.) Soják= *Lactuca orientalis* (Boiss.) Boiss.

8657 (ster.) – 8679 (ster.).

**Scorzonera mollis** M.B.

7957 (fl., fr.) – 8632 (ster.).

**Senecio coronopifolius** Desf.

7909 (fl., fr.).

**Tripleurospermum auriculatum** (Boiss.)  
Rech. fil.

7911 (fl., fr.) – 7980 (fl., fr.).

*Cruciferae***Cardaria draba** (L.) Desv.

7927 (fl., fr.) – 8699 (fl., fr.).

**Carrichtera annua** (L.) DC.

8692 (fl., fr.).

**Diplotaxis acris** (Forsskål) Boiss. (local  
name: Yahag يحج)

7941 (fl., fr.) – 7958 (fl., fr.) – 8594 (fl.) – 8605 (fl., fr.). Leaves eaten as a green salad; plant palatable to sheep.

**Diplotaxis villosa** Boulos & Jallad (local  
name: Harra حارة)

7994 (fl., fr.) – 8603 (fl., fr.). Palatable to sheep.

**Erucaria boveana** Cosson

7984 (fl., fr.).

**Farsetia aegyptia** Turra

7979 (fl., fr.) – 8671 (fl., fr.).

**Lepidium aucheri** Boiss. (local name:  
Rashad رشاد)

7929 (fl., fr.) – 8588 (fl.) – 8637 (fl., fr.) – 8705 (fl., fr.). Plant eaten as a green salad and also used as a fodder.

**Leptaleum filifolium** (Willd.) DC.

7981 (fr.).



**Malcolmia africana** (L.) R. Br.

7932 (fl., fr.).

**Matthiola longipetala** (Vent.) DC.

7996 (fl., fr.) – 8707 (fl.).

**Notoceras bicornis** (Sol.) Caruel

7894 (fl., fr.) – 7936 (fl., fr.) –  
7986 (fl., fr.) – 8609 (fl., fr.) – 8704  
(fl., fr.).

**Sisymbrium irio** L.

7896 (fl., fr.).

**Zilla spinosa** (Turra) Prantl (local name:  
Silla سلة)

7903 (fl., fr.) – 8597 (fl.) – 8607  
(fl., fr.) – 8748 (fl., fr.). Plant palatable  
to sheep and camels.

#### *Cucurbitaceae*

**Citrullus colocynthis** (L.) Schrader  
(local name: Handal حنظل)

8595 (fl.).

#### *Cuscutaceae*

**Cuscuta pedicellata** Ledeb.

8642 (fl.). Parasite on different  
species.

**Cuscuta planiflora** Ten.

8695 (fl.).

#### *Euphorbiaceae*

**Euphorbia retusa** Forsskål (local name:  
Lebbein لبين)

7934 (fl., fr.) – 8604 (fl., fr.).

#### *Geraniaceae*

**Erodium deserti** (Eig) Eig

8649 (fl., fr.) – 8691 (fl., fr.).

**Erodium glaucophyllum** (L.) L'Hér.  
(local name: Dhama دمامة)

7956 (fl., fr.) – 8612 (fl., fr.) –  
8641 (fl., fr.) – 8681 (fl., fr.) – 8734  
(fl., fr.). Palatable to cattle and sheep.

**Erodium hirtum** Willd.

8731 (fl., fr.).

**Erodium laciniatum** (Cav.) Willd. var.  
**laciniatum** (local name: Qarna قرنة)

7922 (fl., fr.) – 8614 (fl., fr.).  
Palatable to sheep.

**Erodium laciniatum** (Cav.) Willd. var.  
**pulverulentum** (Cav.) Boiss.

7947 (fl., fr.) – 8663 (fl., fr.) –  
8686 (fl., fr.).

#### *Gramineae*

**Bromus danthoniae** Trin.

8640 (fl.) – 8677 (fl.) – 8706 (fl.).

**Bromus madritensis** L.

7972 (fl.) – 8673 (fl.) – 8708 (fl.).

**Cynodon dactylon** (L.) Pers. (local  
name: Najila نجيلة)

7908 (fl.) – 8587 (fl.). A good  
fodder.

**Eremopyrum distans** (C. Koch) Nevski

7949 (fl.).

**Hordeum glaucum** Steudel

7904 (fl.) – 7965 (fl.) – 8694 (fl.,  
fr.).

**Lophochloa phleoides** (Vill.) Reichenb.

8702 (fl.).

**Phalaris minor** Retz.

7907 (fl.) – 8675 (fl.) – 8689 (fl.)  
– 8726 (fl.).

**Schismus barbatus** (L.) Thell.

= *S. arabicus* Nees

7954 (fl.) – 8647 (fl.) – 8683 (fl.).

**Stipa capensis** Thunb.

8650 (fl.) – 8729 (fl.).

#### *Iridaceae*

**Iris sisyrinchium** L.

8634 (ster.).

#### *Labiatae*

**Phlomis brachyodon** (Boiss.) Zoh.

8670 (fl.).

**Salvia lanigera** Poiret

7974 (fl., fr.) – 8621 (fl.) – 8628 (fl., fr.) – 8655 (fl., fr.) – 8722 (fl., fr.) – 8744 (fl.).

**Salvia spinosa** L.

8700 (fl.) – 8746 (fl.).

**Thymus bovei** Benth

8660 (ster.) – 8714 (fl. buds).

#### *Leguminosae*

**Acacia raddiana** Savi

8001 (ster.).

**Astragalus bombycinus** Boiss.

7923 (fl., fr.).

**Astragalus corrugatus** Bertol.

7987 (fl., fr.).

**Astragalus schimperi** Boiss.

7928 (fl., fr.) – 7971 (fl., fr.).

**Astragalus spinosus** (Forsskål) Muschler

7919 (fl., fr.) – 7985 (fr.) – 8645 (ster.) – 8716 (fl.) – 8730 (ster.).

**Astragalus tribuloides** Delile var. **minutus** (Boiss.) Boiss.

7938 (fl., fr.) – 7983 (fl., fr.).

**Astragalus** sp.

7946 (fl.).

**Lotus lanuginosus** Vent.

8653 (fl.) – 8697 (fl., fr.). Flowers bright red-purple, drying to violet. Plant locally common in wadi beds.

**Medicago laciniata** (L.) Miller

7993 (fl., fr.).

**Onobrychis ptolemica** (Delile) DC.

8738 (fl., fr.).

**Trigonella stellata** Forsskål (local name: Nafal نجى)

7898 (fl., fr.) – 7951 (fl., fr.) – 8591 (fl.) – 8611 (fl., fr.) – 8639 (fl.) – 8651 (fl.) – 8676 (fl., fr.) – 8693 (fl.). Plant added to ghee of sheep for its preservation and to provide a good smell.

#### *Liliaceae*

**Bellevalia** sp.

8740 (ster.).

**Colchicum ritchii** R. Br.

8636 (ster.).

**Gagea reticulata** (Pallas) A. & H. Schultes

7950 (fl., fr.).

#### *Malvaceae*

**Althaea ludwigii** L.

7924 (fl., fr.) – 8589 (fl., fr.) – 8735 (fl., fr.). Plant palatable to sheep.

**Malva parviflora** L. (local name:  
Khobbeiz خببيز)

7900 (fl., fr.) – 8592 (fl., fr.) –  
8719 (fl., fr.). Plant palatable to sheep.

*Orobanchaceae*

**Cistanche tubulosa** (Schenk) Wight  
(local name: TARTHOUTH تارثوث)

7942 (fl.) – 7991 (fl.) – 8601 (fl.)  
– 8625 (fl.). Parasite on woody *Che-*  
*nopodiaceae*.

*Papaveraceae*

**Roemeria hybrida** (L.) DC.

7952 (fl., fr.).

*Plantaginaceae*

**Plantago amplexicaulis** Cav.

8728 (fl.).

**Plantago ciliata** Desf.

7897 (fl.) – 7914 (fl.).

**Plantago ovata** Forsskål (local name:  
Qreita قريطة)

7953 (fl., fr.) – 8616 (fl., fr.).  
Plant palatable to sheep and camels.

*Polygonaceae*

**Rheum palaestinum** Feinbrun (local  
name: 'Otrofan عطران)

7960 (ster.) – 8627 (ster.) – 8630  
(fl., fr.) – 8736 (ster.).

**Polygonum equisetiforme** Sibth. & Sm.

8674 (ster.) – 8710 (ster.).

**Polygonum patulum** M.B.

7915 (fl., fr.).

*Resedaceae*

**Caylusea hexagyna** (Forsskål) Green

8668 (fl.) – 8680 (fl.) – 8723 (fl.,  
fr.).

**Oligomeris subulata** (Delile) Boiss.

7926 (fl., fr.).

**Reseda decursiva** Forsskål

7975 (fl.).

*Rubiaceae*

**Callipeltis cucullaris** (L.) Rothm. var.  
**aptera** (Boiss. & Buhse) Rech. fil.  
& Ehrend.

8688 (fl.).

*Rutaceae*

**Haplophyllum blanchei** Boiss.

8687 (fl.).

*Scrophulariaceae*

**Kickxia** spec. ined.

7995 (fl.) – 8712 (fl., fr.). Flowers  
light lemon-yellow.

**Scrophularia deserti** Delile

8658 (fl.).

*Solanaceae*

**Hyoscyamus desertorum** (Ascherson  
ex Boiss.) Täckh. (local name:  
Kherwa'a خرووع)

7916 (fl., fr.) – 7967 (fl.) – 8615  
(fl., fr.).

**Lycium depressum** Stocks

8725 (fl., fr.). Flowers white, tube  
short.

*Tamaricaceae*

**Reaumuria hirtella** Jaub. & Spach var.  
**palaestina** (Boiss.) Zoh. & Danin  
8669 (ster.) – 8747 (ster.).

*Umbelliferae*

**Daucus** sp.

7982 (fl.).

**Ducrosia flabellifolia** Boiss. (local name:  
Haza حزا)

7998 (ster.) – 8678 (fl. buds) –  
8717 (fl. buds). The plant is locally  
common.

**Eryngium glomeratum** Lam.

8656 (ster.).

**Peucedanum spreitzenhoferi** Dingler  
(local name: Shomar شومر)

8654 (ster.).

**Torularia torulosa** (Desf.) O. E. Schulz

7917 (fl., fr.) – 7959 (fl., fr.).

*Zygophyllaceae*

**Fagonia bruguieri** DC.

7937 (fl.).

**Fagonia indica** Burm. fil.

8696 (fl., fr.).

**Fagonia olivieri** DC.

7935 (fl.).

**Peganum harmala** L. (local name:  
Hargal حرجل)

7910 (ster.) – 8599 (fl.). Plants  
are not palatable to livestock; seeds  
are added to ghee for its preservation.

*Ephedraceae*

**Ephedra transitoria** Riedl

8672 (male fl.) – 8750 (male and  
female fls.).

*Acknowledgements*

The author wishes to express his sincere thanks to the Keeper and Staff of the Herbarium, Royal Botanic Gardens, Kew, for the facilities and help offered to him during two summer visits in 1974 and 1975. Thanks are also due to Dr. Werner Greuter and Mr. C. C. Townsend for giving their opinions about the new combination of *Arnebia*, and to Dr. Elias Salameh for geological information. Meteorological data were kindly provided by the Meteorological Department, Amman, Mr. M. Adam kindly drew the map. Mr. Jamil Lahham helped in preparing the manuscript. The research grant offered by the Jordan Research Council is much appreciated.

## REFERENCES

- Boissier, E. (1879). *Flora orientalis...* 4. Genevae & Basileae, Lugduni.
- Boulos, L. & W. Jallad (1975). Studies on the Flora of Jordan. 1. *Diplotaxis villosa* sp. nov. (Cruciferae). *Bot. Not.* 128: 365-367.
- Hedge, I. C. & J. Lamond (1970). Capparidaceae. *In*: K. H. Rechinger (ed.), *Flora iranica* 68. Graz)