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SOME NEW AND INTERESTING RECORDS FOR THE FLORA OF TRANSJORDAN

H. U. BAIERLE*, A. A. EL-OQLAH** & H. KÜRSCHNER*

ABSTRACT. Recent extensive floristic collections from Jordan, especially from the southwestern part (mountains of Edom) revealed the presence of 19 taxa new for Transjordan. These are: *Artemisia verlotiorum, Filago gallica, Siebera pungens* (Asteraceae), *Lappula sinaica* (Boraginaceae), *Peltaria angustifolia* (Brassicaceae), *Minuartia intermedia* (Caryophyllaceae), *Anthyllis vulneraria, Medicago arborea, Hedysarum* cf. *pogonocarpum* (Fabaceae), *Lavandula dentata, Origanum dayi* (Lamiaceae), *Leopoldia tenuiflora* (Liliaceae), *Bromus haussknechtii, B. sericeus, Henrardia pubescens, Lolium rigidum* subsp. *negevense, Melica canescens, Stipagrostis drarii* (Poaceae), and *Cotoneaster nummularia* (Rosaceae).

Our knowledge of the flora of Jordan is fairly good since the completion of the *Flora Palaestina* (vol. 4; Feinbrun-Dothan, 1986) and the publication of a checklist of Jordanian vascular plants (Al-Eisawi, 1982). But despite this solid base, the floristic inventory of Jordan is far from complete, as can be seen by the publications of e.g. Al-Eisawi (1983a), and Boulos & Al-Eisawi (1977b). In particular, knowledge of the distribution of the taxa in the different areas of the country is quite fragmentary, even although some regional floristic lists do exist (e.g. Al-Eisawi, 1983b; Boulos & Al-Eisawi, 1977a).

One area insufficiently investigated is that of the mountains of Edom (between Shobak and Petra, Fig. 1) which run parallel to the Syro-African rift valley (Ghor depression, Wadi Araba). Because of their topography and their very diverse edaphic and climatological conditions these mountains are one of the most interesting regions of south-west Jordan both with regard to floristic stock and floral-genetic relationships (Baierle *et al.*, 1988; Kürschner, 1986). Extensive collections made in recent years revealed 19 taxa new to the flora of Transjordan. Those new records suggest that, especially in the quite inaccessible western mountain ranges, more new and interesting taxa can be expected.

The assessment of a 'new record' is based on *Flora Palaestina* (Zohary, 1966, 1972; Feinbrun-Dothan, 1978, 1986) and the *Checklist of Jordan vascular plants* (Al-Eisawi, 1982). Specimens are deposited in the Herbarium Vorderer Orient of the Institut für Systematische Botanik und Pflanzengeographie at Berlin (BSB). Duplicates, when they exist, are in the herbaria of the Department of Botany, Yarmouk University, Irbid (Y), and the Royal Botanic Garden Edinburgh (E).

The new taxa and their families are listed in alphabetical order.

ASTERACEAE

Artemisia verlotiorum Lamotte, Fig. 2.

This species is native to SW China but naturalized elsewhere, occasionally found in C and W Europe (cf. Tutin *et al.*, 1964–1980), and in some areas

* Institut für Systematische Botanik und Pflanzengeographie der Freien Universität Berlin, Altensteinstr. 6, D-1000 Berlin 33.

** Department of Biology, Yarmouk University, Irbid, Jordan.

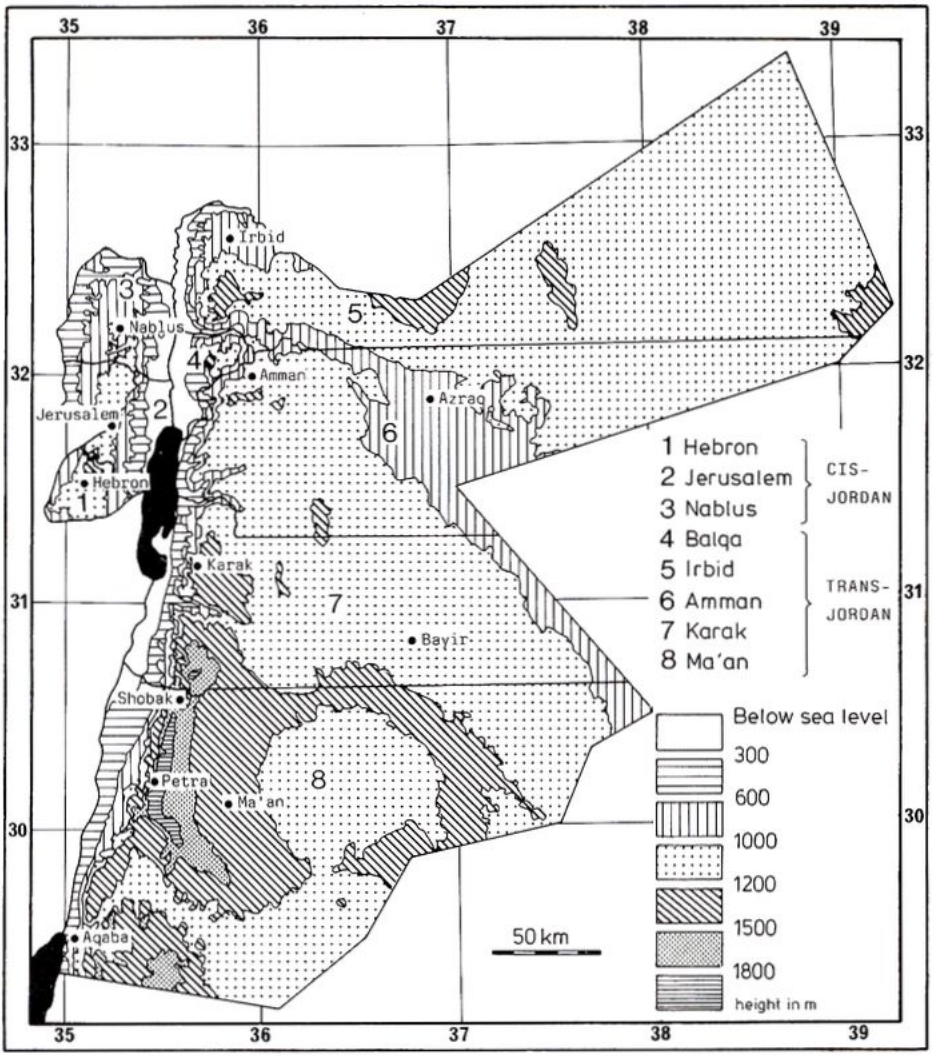

FIG. 1. Jordan. Relief and administrative districts.

of the Middle East. Mouterde (1966–1983) reported it from Syria (Damascus), close to the Jordanian locality of Mafraq.
IRBID: Al Mafraq, NE of the town, sandy soil, 20 iv 1983, *Karim & Al-Quran* 1727.

Filago gallica L., Fig. 2.
Syn.: *Logfia gallica* (L.) Coss. & Germ.

This has a mediterranean distribution pattern extending into the Euro-Siberian region. In *Flora Palaestina* (Feinbrun-Dothan, 1978) an occasional occurrence in the Upper Jordan Valley is mentioned. In the western Edomite highlands between 700 and 1300m it grows exclusively in 'Nubian sandstone' areas dominated by *Juniperus phoenicea* woodlands, either in rock fissures or in other habitats with favourable microclimate.

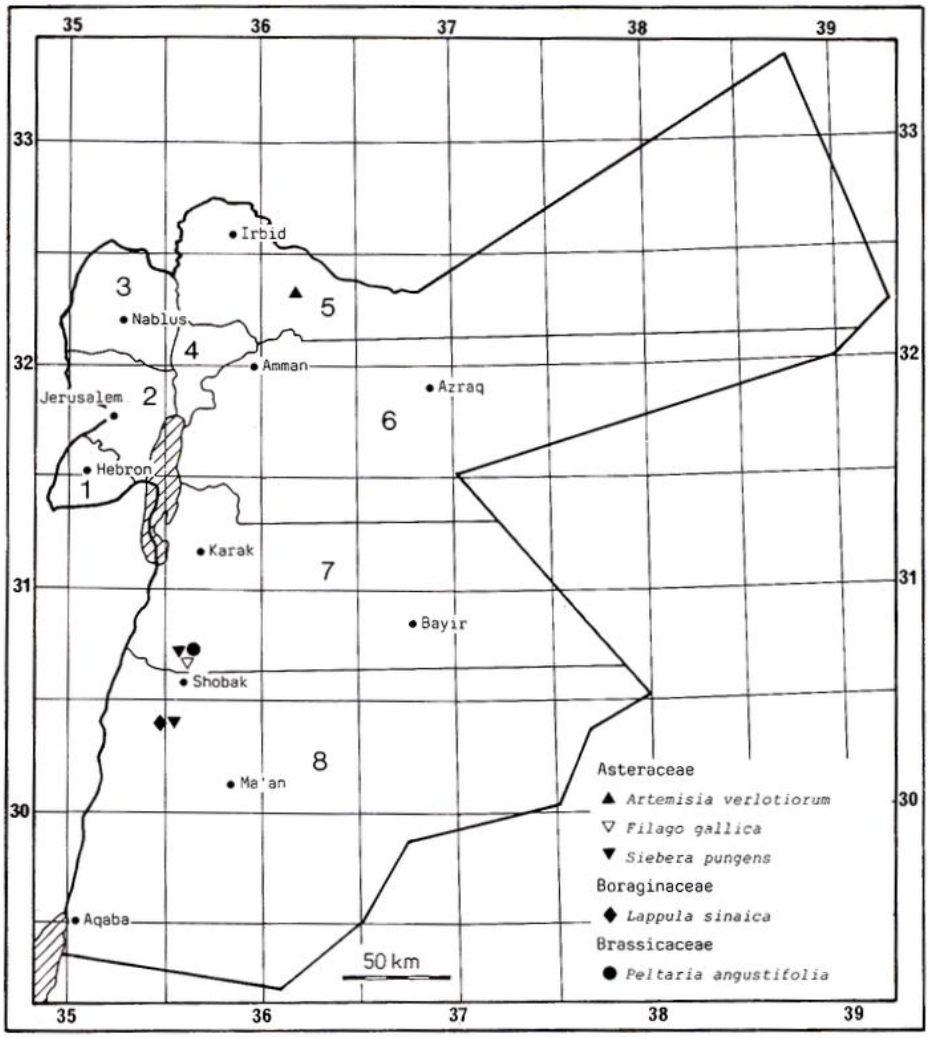

FIG 2. New records from Transjordan: Asteraceae, Boraginaceae, Brassicaceae.

KARAK: 3km WSW Dana, 750m, sandstone with *Juniperus phoenicea* woodland, 8 iv 1986, *Baierle* 86-1556; 3·5km SW Dana (Al Barra), 1200m, rock crevices (sandstone), 20 iv 1987, *Baierle & Pimpl* 87-567.

Siebera pungens (Lam.) J. Gay, Fig. 2.

Although this Irano-Turanian species is not a rare component of the *Artemisia herba-alba* dwarf shrublands and coppiced oak stands (*Quercus calliprinos* woodlands) in the Shobak region, it is not mentioned either by Al-Eisawi (1982) or Feinbrun-Dothan (1978). Grierson & Kupicha (1975) distinguish between *S. pungens* and *S. nana* (syn.: *S. pungens* var. *nana* DC.). This separation seems to be problematic because part of the Jordanian material shows characteristics of both taxa. The area of *S. pungens* so far known includes Turkey, Lebanon, Syria, Iran and S Transcaspia (Grierson & Kupicha, 1975).

MA'AN: Al Hishi (15km SSW of Shobak), 1560m, coppiced *Quercus calliprinos* stand, 20 iv 1986, *Baierle* 86-1978; Bir ed-Dabbaghat, 13km SSW of Shobak, 1650m, coppiced *Quercus calliprinos* stand, 3 v 1987, *Baierle* 87-737. KARAK: 2km NW of Ain Lahda, 1220m, crevices in limestone rock, 20 v 1987, *Baierle* 87-737a.

BORAGINACEAE

Lappula sinaica (DC.) Aschers. & Schweinf., Fig. 2.

This was found only once in a *Juniperus phoenicea* woodland north of Wadi Musa (highlands of Edom). The nearest stations for this inconspicuous species are in Sinai and Palestine (Danin *et al.*, 1985; Post & Dinsmore, 1932).
MA'AN: 13km N of Wadi Musa, c. 1100m, open *Juniperus phoenicea* woodland, 16 iv 1987, *Baierle & Pimpl* 87-400.

BRASSICACEAE

Peltaria angustifolia DC., Fig. 2.

According to Townsend (Townsend & Guest, 1980), this species occurs in the Aegean Islands, Syria, Lebanon, Turkey, Iraq and Iran. The Jordanian specimen was found near Dana (highlands of Edom) in a similar habitat to that described by Townsend & Guest (1980): '. . . on a mountain, among loose limestone stones in a coppiced oak stand . . .'. The nearest localities for this species are in S Syria and Lebanon (Mouterde, 1966–1983).
KARAK: 1km NE of Dana, 1550m, coppiced oak stand, 8 v 1987, *Baierle* 87-833.

CARYOPHYLLACEAE

Minuartia intermedia (Boiss.) Hand.-Mazz., Fig. 3.

Mouterde (1966–1983) gives the distribution of *M. intermedia* as Turkey, Caucasus, Iraq, Syria, Lebanon and USSR. The Jordanian records are all from a very small, well-defined area in the Edomite highlands (Al Barra-area SW of Dana and its surroundings) similar to that of the Jordanian records of *Filago gallica*.
KARAK: Ras 'Ali, 7km WSW of Dana, 760m, *Juniperus phoenicea* woodland on granite rocks, 29 iii 1986, *Baierle & Frey* 86-1216; 3km WSW of Dana, 750m, sandstone with *Juniperus phoenicea* woodland, 8 iv 1986, *Baierle* 86-1532; Al Barra, 4km SW of Dana, 1270m, crevices in sandstone rocks with *Varthemia iphionoides* community, 20 iv 1987, *Baierle & Pimpl* 87-534a.

FABACEAE

Anthyllis vulneraria L., Fig. 3.

A. vulneraria is often split into several subspecies whose overall geographical distribution is still insufficiently known. The Jordanian specimen is closest to *A. vulneraria* subsp. *praepropera* (Kerner) Bornm. Cullen (1969) gave its distribution as S Europe, from Balearic Islands to Greece, Turkey, Cyprus, W Syria. In contrast to this, Mouterde (1966–1983) called all the Syrian material of *A. vulneraria* s.l. *A. maura* Beck and

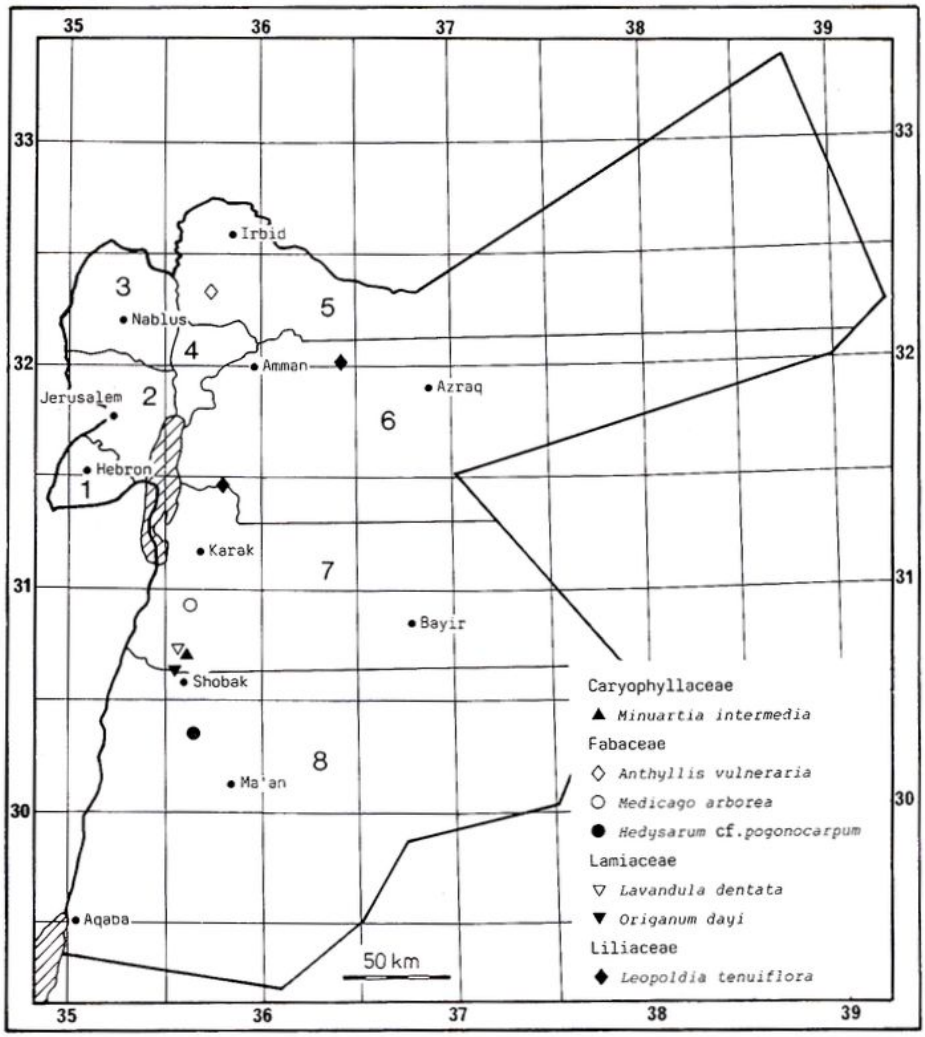

FIG. 3. New records from Transjordan: Caryophyllaceae, Fabaceae, Lamiaceae, Liliaceae.

postulated a land bridge from N Africa to Syria for the migration of this western taxon. Further collections from Jordan and Sinai should help in clarifying this taxonomic problem and related questions.

IRBID: Ajloun-Zobiah, on hill side, calcareous soil, 6 v 1983, *El-Oqlah* 2803.

Medicago arborea L., Fig. 3.

According to Lesins & Lesins (1979), *M. arborea* is distributed from the Canary and Balearic Islands along southern Europe to Turkey. Davis (1969) mentions that '. . . its introduction as an ornamental shrub may have blurred considerably the boundaries of its original area of distribution . . .'. Post (1896) reported *M. arborea* as introduced in the vicinity of Jerusalem. Although the Jordan specimen was growing on rocks, a typical habitat for the species, it is probably of a similar origin.

KARAK: mountains of Edom, near Tafilah on the way to Afra, on rocks, 24 iv 1987, *El-Oqlah & Karim* (s.n.).

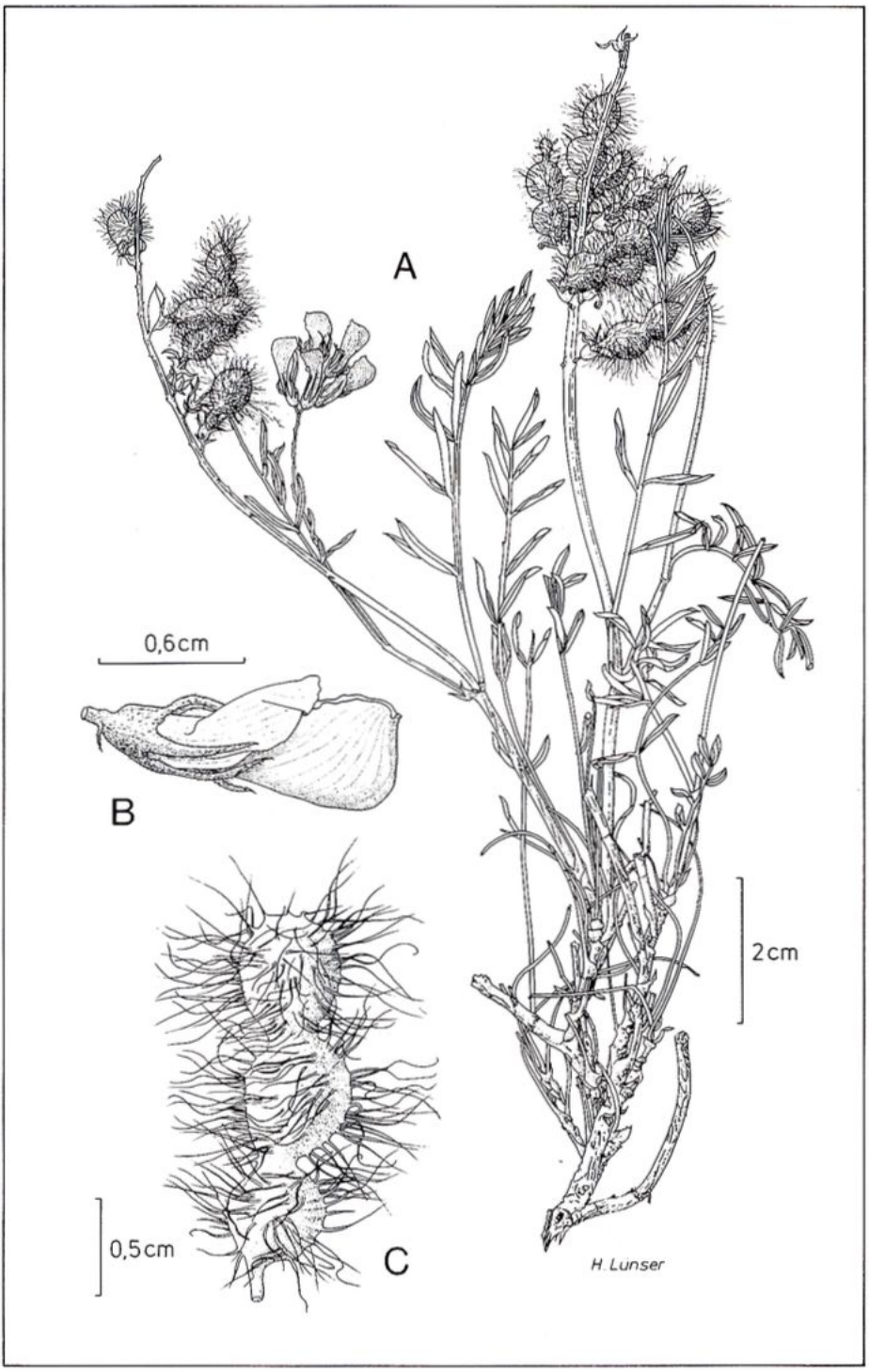

FIG. 4. *Hedysarum* cf. *pogonocarpum* (*Baierle* 87-889). A, habit; B, flower; C, fruit.

Hedysarum cf. **pogonocarpum** Boiss., Figs 3, 4.

The fruit morphology of the Jordanian specimen differs from the description given by Hedge (1969) for *H. pogonocarpum* in the suborbicular form of the loment segments and their number which in our specimen is mostly 3 (*H. pogonocarpum*: 1–2 elliptic segments). With its light yellow corolla and the small size of the loment segments (6–8mm diam.) our specimen is closer to *H. pannosum* (Boiss.) Boiss. than to the white flowered *H. kotschyi* Boiss. From *H. pannosum*, which is mentioned by Al-Eisawi (1982), it differs in its calyx shape (teeth 2–3 times as long as the tube) and the indumentum of the leaves (densely tomentose on lower, sparingly tomentose on upper surface). Hedge (1969) mentions the possibility of intermediates between *H. pannosum* and *H. kotschyi*.

MA'AN: near Jarba, c.5km N of Udruh, c.1300m, small runnel in chalky hill, 11 v 1987, *Baierle* 87-889.

LAMIACEAE

Lavandula dentata L., Figs 3, 5.

The occurrence of this the most easterly distributed species of sect. *Stoechas* in Jordan is very interesting. The nearest localities in SW Asia are from W Saudi Arabia near Taif (Asir Mountains: cf. König, 1986; Miller, 1985) and it is likely that it occurs all along the western mountain range of Arabia to the highlands of Edom. The general distribution of *L. dentata* is given by Miller (1985): Yemen Arab Republic, Saudi Arabia, Ethiopia, Greece, Italy, Algeria, Morocco, Spain, Macaronesia.

KARAK: mountains of Edom, Wadi Dana, c.4km W of Dana, 670m, N facing sandstone rocks with *Juniperus phoenicea* scrub, 12 iii 1986, *Baierle & Kürschner* 86-455.

Origanum dayi Post, Fig. 3.

Previously known only from the Judean Desert and the northern Negev (Ietswaart, 1980).

KARAK: mountains of Edom, Wadi Ghuweir, SE of Fenan, 450m, in sandstone-crevices, 7 iii 1986, *Baierle & Kürschner* 86-193.

LILIACEAE

Leopoldia tenuiflora (Tausch) Heldr., Fig. 3.

Syn.: *Muscari tenuiflorum* Tausch.

L. tenuiflora is recorded from C Europe, Syria, Lebanon, Palestine, Turkey, Caucasus, Iran and Iraq (Stuart, 1985). Other collected *Leopoldia* specimens beside the cited ones from the sandstone area between Dana and Fenan in W Edom (Al Barra, Wadi Dana) are somewhat intermediate between *L. tenuiflora* and *L. deserticola* (Rech. f.) Feinbr.

AMMAN: 40km E of Amman, 500m, rock desert, 3 iv 1980, *Frey & Kürschner* 80-174. KARAK: Wadi Mujib, N of Karak, 350m, soil pockets between limestone, 1 iv 1980, *Frey & Kürschner* 80-46.

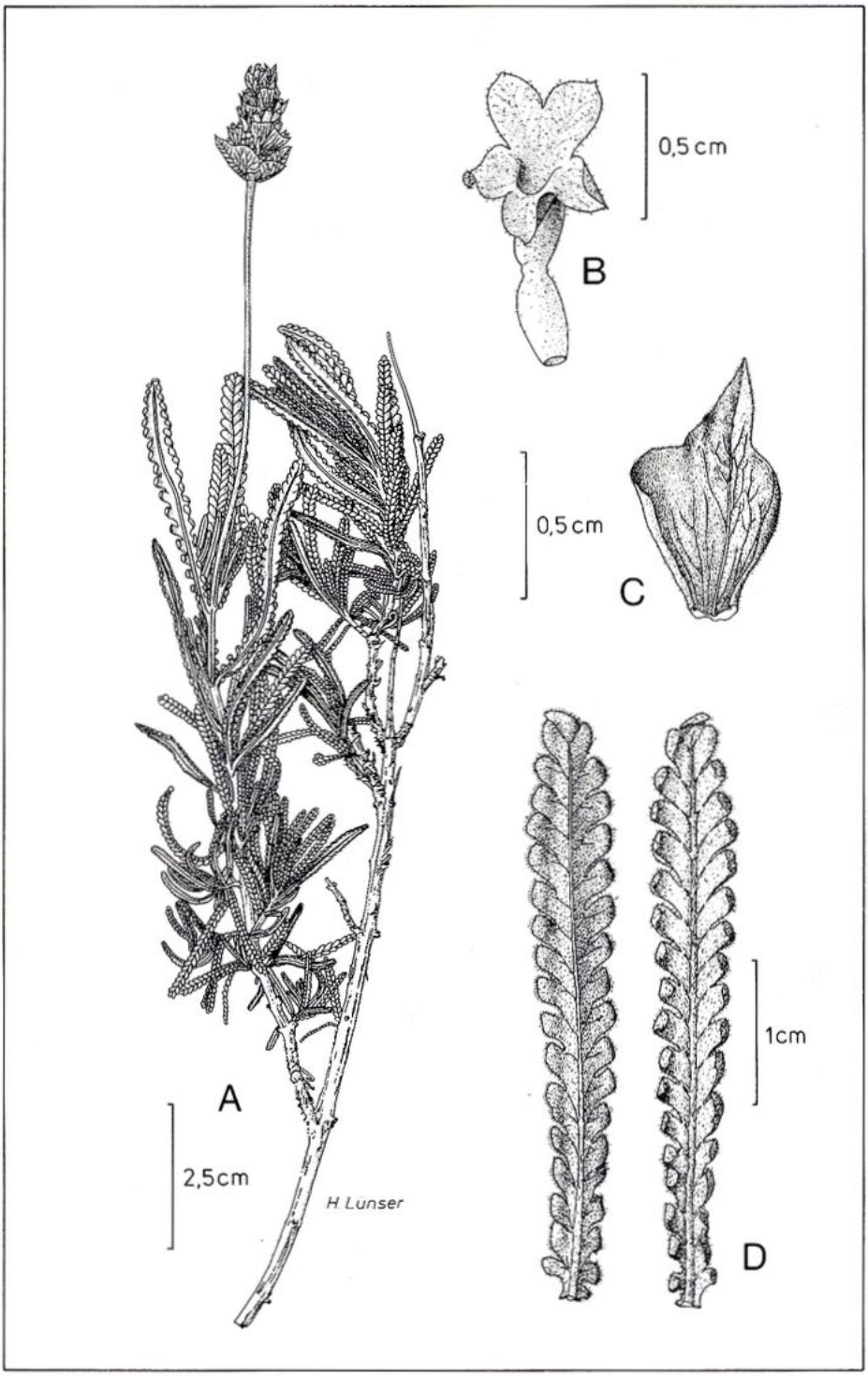

FIG. 5. *Lavandula dentata* (*Baierle & Kürschner* 86-455). A, habit; B, corolla; C, bract; D, leaves.

POACEAE

Bromus haussknechtii Boiss., Fig. 6.

The nearest stations for this species are S Syria (Jabel Khulayb; Post & Dinsmore, 1932), the desert region of Iraq (Bor, 1968) and C Saudi Arabia (N from Riyadh; Baierle & Kürschner, unpubl.).

MA'AN: Wadi Arava, below Jebel er-Risha (N from Gharandal), 230m, sandy wadi with *Acacia raddiana*, 30 iii 1986, *Baierle, Frey & Pimpl* 86-1288, 86-1309. KARAK: Wadi Araba, Chirbe Ghuweibe (NE from Ain el-Fidan), c.150m, irrigated cultivations, sandy soil, 13 iv 1986, *Baierle* 86-1821.

Bromus sericeus Drobov, Fig. 6.

Distribution according to Bor (1968): Iraq, Iran, Transcaspia, Afghanistan, C Asia (Turkmenia to Pamir-Altai).

KARAK: Wadi Araba, Wadi Khalid (N from Fenan), 350m, sandstone boulders with *Zygophylletum dumosi*, 9 iii 1986, *Kürschner* 86-268. MA'AN: mountains of Edom, 10km N of Wadi Musa, c.1040m, barley field in sandstone area, 13 iv 1987, *Baierle, Pimpl & Todt* 87-281.

Henrardia pubescens (Bertol.) C. E. Hubb., Fig. 6.

So far known in the Middle East from Syria and Iraq. Both Bor (1968) and Mouterde (1966–1983) mention that the species probably may also be found in Jordan.

MA'AN: El Fujeij area (NE from Shobak), 1250m, wheat field, 11 v 1987, *Todt* B-420; 2km W of Bir ed-Dabbaghat (SSW from Shobak), 1670m, crevices in limestone, 9 v 1987, *Baierle* 87-842.

Lolium rigidum Gaud. subsp. **negevense** Feinbr., Fig. 6.

This taxon was recently described from the Northern Negev (sandy and sandy loess soils, cf. Feinbrun-Dothan, 1986).

KARAK: Dead Sea Area, Qasr Feifa, 330m below sea-level, sandy tomato field (irrigated), 24 iii 1987, *Baierle & Todt* 87-49.

Melica canescens (Regel) Lavrenko, Fig. 6.

Syn.: *M. cupani* Guss. var. *canescens* Regel.

Until now, no hairy leaved variants of *Melica persica* s.l. were known from Jordan. Davis (1985) reported *M. persica* Kunth. subsp. *canescens* (Regel) P. H. Davis [syn.: *M. canescens* (Regel) Lavrenko] from Syria, Anti-Lebanon, Turkey, Iran and C Asia.

Whatever taxonomic treatment of the hairy leaved variants of *M. persica* s.l. is adopted, the records from Jordan lie far south of their known area of distribution.

MA'AN: 1.5km E of Haj, 1500m, rocky limestone slope, 4 v 1987, *Baierle* 87-772. KARAK: Jebel 'Ata 'Ita (E of Dana), 1640m, fissures in stone heap (basalt), 8 v 1987, *Baierle* 87-837.

Stipagrostis drarii (Täckh.) De Winter, Fig. 6.

This species is a component of the *Haloxylon persicum* community type on sandy soils in the xerotropically influenced, southern part of the Wadi Araba. In the northern Wadi Araba it is absent in the same community type.

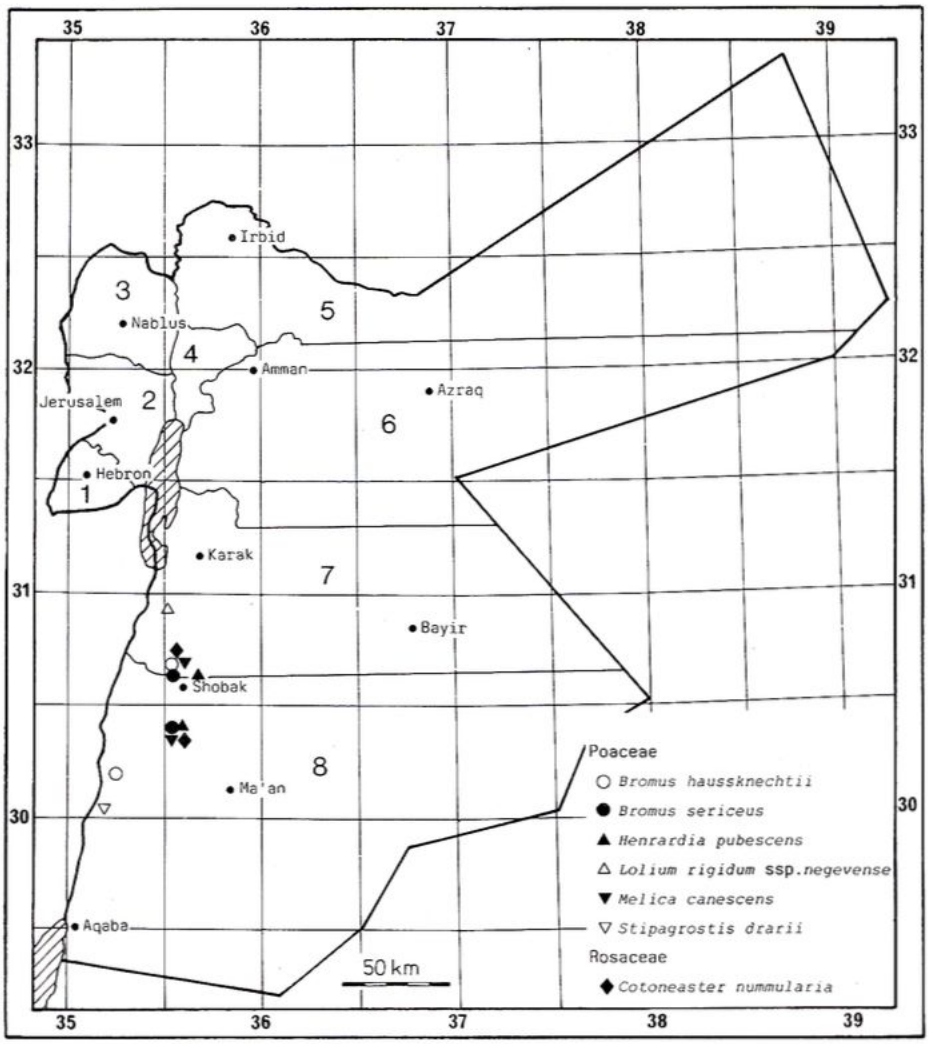

FIG. 6. New records from Transjordan: Poaceae, Rosaceae.

Täckholm (1974) mentioned *S. drarii* from N Sinai, Cope (1985) from Saudi Arabia.

MA'AN: Wadi Araba, 200m, 3km SW of Gharandal, on sand, 27 iv 1987, *Baierle & Pimpl*, 87-701.

ROSACEAE

Cotoneaster nummularia Fischer & Meyer.

The next known stands of *C. nummularia* are in Lebanon and Syria (Browicz, 1972, Mouterde, 1966–1983). As with nearly all the other species mentioned in this paper there is a large gap in the known area of distribution to the now known occurrence in southern Jordan. Browicz (loc. cit.) gives the distribution of this species as Crete, Cyprus, Turkey, Latakia (Syria), Lebanon, N Iraq, Caucasia, W Iran.

The taxonomic treatment of the *C. racemiflorus* aggr. seems far from clear. KARAK: mountains of Edom, Tafila area, Bir er-Ruman, on rocks, 22 iv 1987, *El-Oqlah & Karim* (s.n.). MA'AN: near Ain el-Arja (SE of Bir ed-Dabbaghat), 1520m, smooth faced limestone rock, 10 v 1987, *Baierle*, 87-870.

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