

Notes on the genus *Deverra* (*Umbelliferae*)

Poznámky k rodu *Deverra* (*Umbelliferae*)

Jindřich Chrtek, Jana Osbornová and Michaela Šourková

CHRTEK J.¹⁾, OSBORNŮVÁ J.²⁾ et ŠOURKOVÁ M.²⁾ (1984): Notes on the genus *Deverra* (*Umbelliferae*). — Preslia, Praha, 56 : 97—105.

Delimitation of three sections of the genus *Deverra* DC. (syn. *Pituranthos* VIV.) is proposed — sect. *Deverra*, sect. *Musilia* CHRTEK, OSBORNŮVÁ et ŠOURKOVÁ and sect. *Deverraria* DC. Genus *Deverra* was studied especially in Egypt and in adjacent territories. Key, various notes, descriptions, and distribution of the following taxa are given: *D. tortuosa* (DESF.) DC. subsp. *tortuosa* and subsp. *arabica* CHRTEK, OSBORNŮVÁ et ŠOURKOVÁ, *D. triradiata* HOCHST. ex BOISS., *D. musilii* CHRTEK, OSBORNŮVÁ et ŠOURKOVÁ.

¹⁾ Department of Botany, National Museum, 252 43 Průhonice, Czechoslovakia

²⁾ Department of Botany (Higher Plants), Charles University, 128 01 Praha 2, Czechoslovakia

INTRODUCTION

During field work in Egypt in 1967—1978 the attention of the first and the second author was drawn to the species of genus *Deverra* DC. (syn. *Pituranthos* VIV.). They found that there is a difference between populations of *D. tortuosa* (DESF.) DC. growing in the Libyan Desert and those from the Arabic Desert including the Red Sea coast. This fact has been recently proved by the second author during her stay at Cairo University in 1982.

Besides field observations, study of material kept in the following herbaria collections was conducted: CAI — Department of Botany, Cairo University, Giza; PRČ — Department of Botany (Higher Plants), Charles University of Prague; PR — Department of Botany, National Museum, Průhonice near Prague.

Within material studied in PRČ herbarium we found interesting plant collected by A. MUSIL during his last journey to Saudi Arabia in 1915. The plant appeared to be a new species of the genus *Deverra*.

In connection with the above-mentioned study of the genus *Deverra* our attention was directed to the taxa of supraspecific level. Taking into account morphological and chorological characteristics of the rest of species of the genus we attempted a new subdivision of the entire genus.

SUBDIVISION OF THE GENUS *DEVERRA*

The genus *Deverra* DC. (syn. *Pituranthos* VIV.) comprises about 10 species well-adapted by their morphology and eco-physiology to desert and semi-desert conditions. All plants are shrubby perennials (30—)40—80(—120) cm high with deep root systems reaching sometimes to the depth of 5 m in

sandy substrate. Stems are stout, usually at least at the base suffrutescent and densely branched, and of leafless appearance; the soon deciduous leaves are often reduced to sheaths only. Plants are often found simultaneously in both, flowering and fruiting stage.

Most of species are limited to relatively small areas (cf. WILLIS 1966 : 885). Their distribution is confined predominantly to North Africa. From its western part, for example the following species are known: *D. battandieri* (MAIRE) CHRTEK, OSBORNOVÁ et ŠOURKOVÁ¹), *D. chlorantha* COSSON et DURIEU s.l., *D. fallax* BATT. et TRABUT, *D. intermedia* CHEVALL., *D. reboudii* COSSON et DURIEU, *D. rohlfsiana* ASCHERSON, *D. scoparia* COSSON et DURIEU s.l., *D. tortuosa* (DESF.) DC. (e.g. WOLFF 1927 : 99—103, QUÉZEL et SANTA 1963 : 666). In the eastern part of North Africa two species are present, viz. *D. tortuosa* (DESF.) DC. and *D. triradiata* HOCHST. ex BOISS. These are also growing in adjacent territories of Asia — Israel, Jordan, Sinai (TÄCKHOLM 1974 : 308, ZOHARY 1972 : 422—423, AL-EISAWI 1982 : 177). A newly described species, *D. musilii* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ was collected in Saudi Arabia. No representative of the genus is known from the territories of Syria, Turkey, Iraq, and Iran. Two quite isolated species, *D. aphylla* (CHAM. et SCHLECHT.) DC. and *D. burchellii* (DC.) ECKLON et ZEYHER, occur in South and South-West Africa (SONDER 1862 : 548—549, SCHREIBER et al. 1967 : 4—5).

The group appears to be homogenous, but certain features that are common to several species within the group indicate heterogeneity.

The first attempt to delimit the genus was made by DE CANDOLLE (1829 : 46). He described two sections: the section *Deverraria* with two species *Bubon aphyllus* CHAM. et SCHLECHT. and *B. tortuosus* DESF., and the section *Pituranthos* with one species *P. denudatus* VIV. which was not known to him directly. In 1830 he used the orthographic variant "*Pithuranthos*" but he retained the same subdivision. The species were already presented under the name *Deverra*: *Deverra aphylla*, *D. tortuosa*, *D. pituranthos*. His subdivision was based on characters of the indumentum of fruits: sect. *Deverraria* "fructus villosi squamigeri", sect. *Pithuranthos* "fructus squamigeri" (DE CANDOLLE 1830 : 143—144). In this treatment features in fruit indumentum were obviously overestimated, probably due to the limited amount of herbarium material available as well as to Viviani's very brief original description and drawing (VIVIANI 1824 : 15—16 et tab. VII). Within the whole genus the fruit indumentum varies a great deal. There is, however, a possibility to use the features of indumentum for evaluation on specific or subspecific levels. Contemporarily, *D. tortuosa* and *D. pituranthos* are held to be the same species. This fact has already been mentioned by PAMPANINI (1931 : 344), who saw the original specimen. No attempt was ever made towards a new subdivision of the genus.

We studied the herbarium material and literature and analysed some anatomical and morphological features, e.g. anatomy of fruits, morphology of fruits, and orientation of stomata on stems. Taking into consideration the geographical distribution of species as well, we came to the conclusion that

¹) *Deverra battandieri* (MAIRE) CHRTEK, OSBORNOVÁ et ŠOURKOVÁ, comb. nova. — Bas.: *Pituranthos battandieri* MAIRE Bull. Soc. Hist. Nat. Afr. Nord 9 : 177, 1918.

it is possible to divide the genus *Deverra* into three sections which are characterized as follows.

Deverra DC. *Mém. Omb.* 45, 1829; *Prodr.* 4 : 143, 1830

Syn.: *Pituranthos* VIV. Fl. Lib. Spec. 15 et tab. VII, 1824; *Pityranthus*, *Pithyranthus*, *Pithyranthos* auct. div., non *Pityranthus* MART.; *Hymenophora* VIV. ex COSSON Bull. Soc. Bot. Fr. 12 : 281, 1865 (ut *Hymenophora denudata* VIV. pro syn. ad *Deverram Pituranthos* DC.).²⁾

Typus generis: *D. tortuosa* (DESF.) DC. = *Bubon tortuosus* DESF.

Suffrutices usque 1,2 m alti. Folia basalia 1—3-pinnatisecta, angusta, superiora mox decidua, saepe in vaginam solam reducta. Umbellae compositae, phylla involucrorum et involucellorum persistentia vel caduca. Flores parvi, sepala inconspicua vel vix evoluta, petala albida cum lobo apicali intra reflexo; stylopodium latum, humile, margine saepe undulato; styli ± divaricati. Schizocarpium circumscriptione rotunda, ovata vel oblonga, pilosum (posterius aliquando glabrescens) usque papillosum; juga macroscopice praecipue ad fructus pilosos inconspicua, in sectione transversali juga primaria aut inconspicua, humilia aut manifeste evoluta (valleculis obviis alternata) aut ea primaria secundariaque evoluta; vittae vallecularae (eventualiter in jugis secundariis) singulae, commissurales 2.

sect. *Deverra*

Syn.: sect. *Pituranthos* (VIV.) DC. *Prodr.* 4 : 144, 1830.

Typus sectionis: *Deverra tortuosa* (DESF.) DC.

Stomata ad caulis axem parallela. Fructus circumscriptione rotunda vel late ovata (maxime paulum longiores quam lati), pilosi usque papilloso; valleculae plerumque non profundae, latae.

Area geographica: Praecipue in Africa boreo-occidentali, solum *D. tortuosa* etiam in Libya, Aegypto, Israelia et Iordania distributa est.

Species sectionis: *D. battandieri* (MAIRE) CHRTEK, OSBORNOVÁ et ŠOURKOVÁ, *D. chlorantha* COSSON et DURIEU s.l., *D. fallax* BATT. et TRABUT, *D. intermedia* CHEVALL., *D. reboudii* COSSON et DURIEU, *D. rohlfiana* ASCHERSON, *D. scoparia* COSSON et DURIEU s.l., *D. tortuosa* (DESF.) DC.

Sect. *Deverraria* DC. *Prodr.* 4 : 143, 1830

Typus sectionis: *Deverra aphylla* (CHAM. et SCHLECHT.) DC.

Stomata ad caulis axem transversalia. Fructus circumscriptione ovata usque late ovata maxime paulum longiores quam lati, pilosi vel papilloso; juga conspicua.

Area geographica: Africa australis et austro-occidentalis.

²⁾ The genus was described by VIVIANI as *Pituranthos* with the only species *P. denudatus* from Cyrenaica. VIVIANI derived the generic name *Pituranthos* from the Greek word: „πυτάνθος [pityranthos] furfura, quâ involucra, involuella, et fructus tegentur“ (VIVIANI 1824 : 15). VIVIANI'S name cannot be used, however, as SCHREIBER et al. (1967 : 4) explained: „Der in jüngerer Zeit für diese Gattung gebrauchte Name *Pituranthos* VIV. (1824) ist illegitim wegen *Pityranthus* MART. (1814)“ [verosimiliter recte 1817]. *Pityranthus* C. F. P. MARTIUS is typified by the species *P. crassifolius* C. F. P. MARTIUS which corresponds with *Achyranthes repens* L. from the family *Amaranthaceae* (cf. SCHINZ 1934 : 71, FARR et al. 1979 : 1350). MARTIUS (1817) probably derived the name of his genus *Pityranthus* from the same Greek basis. This Greek basis was used in the two Latin generic names differently, however (VIVIANI: *Pitur-anthos*, MARTIUS: *Pityr-anthus*). Following article 75 of the International Code of Botanical Nomenclature 1978 both names must be considered as variants only. Earlier name is that of the genus from the family *Amaranthaceae* (*Pityranthus*); therefore, *Deverra* DC. (1829) must be used instead of VIVIANI'S name. — In connection with the genus *Deverra* (*Pituranthos* VIV.) the name *Hymenophora* was sometimes mentioned. COSSON was the first to publish the name *Hymenophora denudata* VIV. but as a synonym for *Deverra pituranthos* DC. only (COSSON 1865 : 281). He quoted the original herbarium label: „*Hymenophora denudata* VIV.: Herb. Libyc.“ (COSSON l. c.). VIVIANI himself had never published this name; all later notes on it originated from COSSON'S work (e.g. Index Kewensis 1 : 1189, 1895 et 2 : 550, 1895, WOLFF 1927 : 97). The generic name *Hymenophora* is not even listed in FARR et al. (1979).

Species sectionis: *D. aphylla* (CHAM. et SCHLECHT.) DC., *D. burchellii* (DC.) ECKLON et ZEYHER.

Sect. **Musilia** CHRTEK, OSBORNOVÁ et ŠOURKOVÁ, sect. nova

(Etymologia: sectio in honore prof. A. Musilii denominata.)

Typus sectionis: *Deverra triradiata* HOCHST. ex BOISS.

Stomata ad caulis axem obliqua usque transversalia. Fructus circumscriptione anguste ovata vel oblonga, 2–3-plo longiores quam lati, semper dense pilosi; valleculae jugaque in sectione transversali bene conspicua.

Area geographica: Aegyptus, Sinai, Israelia, Iordania, Saudi Arabia.

Species sectionis: *D. musilii* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ, *D. triradiata* HOCHST. ex BOISS.

DEVERRA SPECIES IN EGYPT AND ADJACENT TERRITORIES

In Egypt and adjacent regions only two species, *D. tortuosa* (DESF.) DC. and *D. triradiata* HOCHST. ex BOISS. are now recognized. Both species are mentioned among leading desert perennials in the local Saharo-Arabian plant communities (ZOHARY 1973 : 218, 221).

Two Himalayan species mentioned as *Pituranthos nuda* (LINDLEY) BENTHAM and *P. thomsonii* CLARKE (CLARKE 1879 : 680) belong to the genus *Eriocycla* LINDLEY. *Deverra korolkovii* REGEN et SCHMALH. was sometimes included in the genus. The name is a synonym for *Ammi copticum* L. or *Trachyspermum ammi* (L.) SPRAGUE (cf. ŠIŠKIN 1950 : 378–380). *Ammi copticum* was reported also from Egypt as an isolated, lately never confirmed record by MUSCHLER (1912 : 700) and TÄCKHOLM (1956 : 200). TÄCKHOLM (1974 : 390) no longer includes it in Egyptian flora.

Despite the fact that the valid generic name is *Deverra* DC., in modern Egyptian floras the following orthographic variants of the generic name *Pituranthos* were used: *Pityranthus* (TÄCKHOLM 1956 : 142); *Pithyranthus* (MUSCHLER 1912 : 696, RAMIS 1929 : 142); *Pituranthos* (TÄCKHOLM 1974 : 308).

Key to species of the genus *Deverra* known from Egypt and adjacent territories

- 1a Rays 6–10, bracts and bracteoles persists; fruits \pm 1–1.5 mm long, \pm globular or broadly ovoid, sparingly shortly hirtellous (sect. *Deverra*) *D. tortuosa* (DESF.) DC.
- 1b Rays (2–)3–4(–6), bracts and bracteoles caducous; fruits (2–)3–5 mm long, narrowly ovoid or oblong, densely long-hairy (sect. *Musilia*) 2
- 2a Bracteoles \pm 3 mm long, hairs on fruits \pm 0.5 mm long . . . *D. triradiata* HOCHST. ex BOISS.
- 2b Bracteoles \pm 5 mm long, hairs on fruits \pm 1 mm long
. *D. musilii* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ

1. *D. tortuosa* (DESF.) DC. Prodr. 4 : 143, 1830

Syn.: *Bubon tortuosum* DESF. Fl. Atl. 1 : 257 et tab. 73, 1799; *Pituranthos denudatus* VIV. Fl. Lib. Spec. 15 et tab. 7, 1824; *Pituranthos tortuosa* (DESF.) BENTHAM et HOOKER fil. ex ASCHERSON et SCHWEINF. Mém. Inst. Egypt. 2 : 80, 1887 (ut „*Pityranthus*“).

Perennial blue-green plant usually 40–60 cm high, “dichotomously” branched from base with numerous glabrous branches, habitus spherical to pyramidal-spherical. Root leaves and lower stem leaves rounded in outline, bipinnatisect into linear-subulate, rigid, divergent lobes; upper stem leaves

usually reduced to oblong sheaths with large membranaceous margin; all leaves glabrous. Umbels with (4—)6(—10) unequal, 7—13(—17) mm long, sparingly papillose rays; bracts persistent, oblong-ovate to lanceolate, membranaceous, broadly margined, 1,0—1,5(—2,0) mm long; partial umbel (6—)8—10(—12)-flowered, pedicels ca 2 mm long, sparingly papillose, bracteoles shorter than pedicels; flowers white; fruits hemispherical ca 1—1.5 mm long, hirtellous.

The species is not uniform in the territory of Egypt, and it can be divided into two different types. The difference between them is mainly visible in the field.

Plants from the Libyan Desert form dense spherical halfshrubs. "Dichotomously" branched stems are thick and gradually becoming thinner. The angle of branching is 60—90° as a rule. (Fig. 1. — Plate VII.)

Plants from the Arabic Desert and the Red Sea coast form loose, not dense and not globose half-shrubs more or less of virgate or fasciculate appearance. Stems are not so densely branched, the angle of branching is sharper, 40° to 80°. Branches are "subdichotomous", sometimes nearly alternate. Plants often consist of old, thick and straight stems with thin, young lateral branches that are usually "dichotomously" branched. (Fig. 2, 3, 4—Plates VIII - X).

No morphological differences in flowers and fruits were found. Both types are well distinguished in the field by their habit.

The possible influence of browsing was checked in the field when comparing unbrowsed, slightly browsed and heavily browsed plants in various areas with different pasturing activities. Still both types remained quite different.

In the nature both types occur in large stretches of uniform populations. We are describing the first type from the Libyan Desert as subsp. *tortuosa*, the second type from the Arabic Desert and the Red Sea coast as subsp. *arabica*.

subsp. *tortuosa*

Dense spherical half-shrubs with "dichotomously" branched stems (angle usually 60—90°); branches thick, gradually becoming thinner, of equal appearance.

Specimina selecta:

Tunisia: Arad et Nefzaoua, Gabès, in arenosis deserti, 1909, C. J. PITARD, PRG; Nefzaoua, Gabès, in aridis deserti, 1909, C. J. PITARD, PRG.

Libya: Benghazi, 1882, G. RÜHMER, PR.

Egypt: On the coastal road 46 km before Mersa Matruh, 1966, V. TÄCKHOLM, CAI; Ras El Hekma, 1963, BOULOS L., CAI; Wadi Natrun, 1976, J. CHRTEK, Z. SLAVÍKOVÁ, CAI, PRG; Cairo-Alexandria desert road, Tahrir resthouse, 1967, KOSINOVÁ, CHRTEK, PRG; Ad Pyramides gyz., s. d., SIEBER, PR, PRG; BORNM., Iter Aegypt. 1908 No. 10681: Kairo, in desertis arenosis ad pyramides (prope Gise), 1908, BORNMÜLLER, PR; MUSCHLER, Iter aegypt. sec. No. 236: Canalstation bei Ismailieh, 1903, MUSCHLER, PRG.

In Egypt distributed very commonly in the Libyan Desert including the Mediterranean coast, in the Isthmic Desert, and in the Oases of the Libyan Desert (Wadi Natroun); also known from Libya, Tunisia. Possibly occurring in Israel.

The species *D. tortuosa* was originally described from Tunisia (prope Kerwan in regno Tunetano) by DESFONTAINES (1799 : 257) and the illustration

agrees with Egyptian plants from the Libyan Desert. There are, however somewhat different types in Tunisia, characterized by stout stems with prolonged internodes in middle and basal part of stem described as var. *virgata* COSSON et KRALIK (cf. BONNET et BARRATTE 1896 : 172). In the material kept in PR herbarium we had the opportunity to see both: densely branched plants with stout stems and short internodes identified as *D. tortuosa* and those of less dense appearance with prolonged internodes at base and in middle part of stem identified as *D. tortuosa* var. *virgata*. Both types were collected at the same locality by C. J. PITARD (Flore de Tunisie, Arad et Nefzaoua, Gabès: in arenosis deserti, 1909, leg. C. J. PITARD). Similar variability in the above-mentioned features was observed by us in a few populations of *D. tortuosa* subsp. *tortuosa* in the Libyan Desert, e.g. in Wadi Natroun.

subsp. ***arabica*** CHRTEK, OSBORNOVÁ et ŠOURKOVÁ, subsp. nova

Suffrutex habitu fasciulari, laxus; caules crassi, erecti, ramuli laterales tenues, saepissime dichotome ramificati, angulus divergentiae 40–80°.

Typus: Wadi Dugla bei Cairo, mittelaegyptische Wüste, arabische Seite, Novbr. 1878, G. SCHWEINFURTH (in herb. PR. asservatur). (Fig. 2. — Plate VIII.)

Specimina selecta:

Egypt: Cairo Suez road, 1978, A. SOLIMAN et H. HOSNI, CAI; Wadi Dugla bei Cairo, 1878, G. SCHWEINFURTH, PR; 4 km from Ain Sokhna, 1959, V. TÄCKHOLM et al., CAI, PRC; Ain Sokhna, 1960 V. Täckholm et al. PRC; Wadi Hoff, 1977, A. SOLIMAN, CAI; MUSCHLER, Iter aegypt. sec. No. 639; Grosser versteinertes Wald b. Heluan, 1903, MUSCHLER, PRC; Wadi Qusseib, west coast of Gulf of Suez, 1964, M. KASSAS, CAI; Wadi Qiseib, North Galala, 1967, J. KOSINOVÁ, M. KONČALOVÁ, PRC; Wadi Aber of Gebl Ataqa, 1958, V. TÄCKHOLM, CAI et 1966, V. TÄCKHOLM et al., CAI; MUSCHLER, Iter aegypt. primum No. 345: Wüste bei Saqqarah, 1903, MUSCHLER, PRC; Sakkara, Cairo, s.d., MUSCHLER, PR.

Israel: Fl. Terrae Israelis Exs. No. 754: Env. of Dead Sea, southern edge of the Dead Sea near the works, 1939, YEHUDAI, PRC.

Growing in the Arabic Desert, Red Sea coast, Sinai Peninsula, and in Israel. Exceptionally also on the eastern border of the Libyan Desert (Saqqarra). Occurrence in sandy habitats of the Isthmic Desert is possible.

2. *D. triradiata* HOCHST. ex BOISS. Fl. Orient. 2 : 861, 1872

Syn.: *Pituranthos triradiatus* (HOCHST. ex BOISS.) ASCHERSON et SCHWEINF. Mém. Inst. Egypt. 2 : 80, 1887.

Perennial yellow-green plant 35–100 cm high, glabrous; stems erect, juncaceous, sparsely alternately branched, branches stout. Cauline leaves strongly reduced to short ovate-triangular sheaths, sometimes with remains of lamina. Umbels with (2–)3–6 glabrous unequal (3–)5–15(–17) mm long rays; bracts early caducous; partial umbels (2–)3–6 flowered, pedicels unequal, 2 mm long, whitish shortly hairy; bracteoles caducous; fruits narrowly ovoid or oblong (3–)4–5 mm long, densely hairy, hairs ± 0.5 mm long, mericarp three times longer than broad.

Specimina selecta:

Egypt: Moghira Oasis, sand sheets NE of Moghira, 1977, J. KOSINOVÁ, PRC; Wadi Dugla, Cairo, 1878, SCHWEINFURTH, PR.

Distributed in Egypt, Israel, Jordan.

3. *Deverra musilii* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ, sp. nova

Plantae perennes, caules 30 cm alti, verosimiliter altiores, saepissime alternate ramosi, firmi, glabri, leviter striati. Folia caulina parva, laminae in plantis adultis nullae, subnullae vel parvae (breves, lineales raro bipinnatae), glabrae, vaginae persistentes, 5–10 mm longae, membranaceae, glabrae. Umbellae laterales vel terminales parvae, pauciradiatae, radii (3–)4–5, ± inaequales, ± glabri, involucra saepissime 5-phylla, bracteae triangulares, late membranaceae, breviter pilosae; umbellulae approximatae, pauciflorae (flores 2–4), involucelli phylla 5, ovate lanceolata, margine membranaceo, mox decidua, ± 5 mm longa; pedicelli breviter pilosi; fructus juveniles dense longe lanati (pili ± 1 mm longi).

Typus: [North Saudi-Arabia] I.: el-Korzi. N.: Habb el-Kôh, 7. 2. 1915, leg. MUSIL (in herb. PRC asservatur).

The specimen was collected by A. MUSIL (1915) and was determined by VELENOVSKÝ (1923 : 3) as *Deverra chlorantha* COSSON et DURIEU. This species grows only in the western part of North Africa, however, and does not penetrate eastwards. Also, *D. chlorantha* has a different habit (slender branches) and fruits (size, form, and indumentum are not the same). Fruits are relatively small, hemispherical and shortly pubescent. Plants collected by MUSIL do not approach *D. chlorantha* but are very similar to *D. triradiata* HOCHST. ex BOISS. They differ, however, by conspicuously pubescent ovary (hairs are as long as the diameter of the ovary), by longer bracteoles (± 5 mm long), which, in young stages, completely cover the partial umbels. *D. triradiata* has hairs on ovary short (reaching only one half of diameter of ovary), and bracteoles are shorter (± 3 mm long). There are probably also certain differences in the form of branching. Unfortunately, this feature is not clear in herbarium material, and no live material was available.

Regarding the above-mentioned differences, which can be considered as important ones within the genus *Deverra*, we are describing MUSIL's plant as a new species, *D. musilii*, in honor of this well-known Czech orientalist and Arabian traveller who collected plants during his travels. Material from MUSIL's journeys was worked up by VELENOVSKÝ and results were published in two contributions (VELENOVSKÝ 1912, 1923).

D. musilii is an endemic plant of the northern part of Saudi Arabia and represents the most eastern species in the area of distribution of the entire genus.

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SUMMARY

Species of the genus *Deverra* DC. (syn. *Pituranthos* VIV.) were studied. After analysing selected morphological and anatomical features and taking into consideration the geographical distribution of species, the authors concluded that the genus can be divided into three sections as follows:

1. sect. *Deverra* is the richest in number of species that occur in North Africa, mainly in its NW part. Stomata are situated parallel with the axis of the stem. Fruits are rounded or broadly ovate in outline, at most somewhat longer than broad, hairy to papillose. Furrows are mostly shallow and broad as a rule. This section comprises species *D. battandieri* (MAIRE) CHRTEK, OSBORNOVÁ et ŠOURKOVÁ; *D. chlorantha* COSSON et DURIEU s.l.; *D. fallax* BATT. et TRABUT; *D. intermedia* CHEVALL.; *D. reboudii* COSSON et DURIEU; *D. rohlfiana* ASCHERSON; *D. scoparia* COSSON et DURIEU s.l.; *D. tortuosa* (DESF.) DC.

2. sect. *Deverraria* DC. is restricted to S and SW Africa and characterized by the transverse position of stomata on the stem. Fruits are broadly ovate in outline, at most somewhat longer than broad, hairy or papillose, with conspicuous ribs. Only two species belong to the section, *D. aphylla* (CHAM. et SCHLECHT.) DC. and *D. burchellii* (DC.) ECKLON et ZEYHER.

3. sect. *Musilia* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ is distributed in Egypt, Jordan, Israel, and Saudi Arabia. Stomata are oblique to transverse in position. Fruits differ conspicuously from those in the two preceding sections in being narrowly ovate to oblong in outline, twice to three times as long as broad, always densely hairy. Ribs and furrows on transverse sections of fruits are prominent. The section comprises species *D. triradiata* HOCHST. ex BOISS. and stenoendemic *D. musilii* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ.

Species of the genus growing in Egypt and adjacent territories were studied in more detail. Based on their collections and field observations as well as on comparison of CAI, PR, and PRC herbaria material the authors recognized two subspecies of *D. tortuosa*: subsp. *tortuosa* of spherical habit with densely „dichotomously“ branched stems and subsp. *arabica* of virgate or fasciculate appearance. The first subspecies is confined to the Libyan Desert while the second one is confined to the Arabic Desert and the Red Sea coast. *D. triradiata* occurs in Egypt, Israel, and Jordan. Closely related *D. musilii* has been newly described by the authors from the collections of A. MUSIL from Saudi Arabia. *D. musilii* differs from *D. triradiata* above all in characters of fruit indumentum. It represents the most eastern species within the area of the entire genus.

Key for determination of *Deverra* species known from Egypt and adjacent territories is included. Further studies would undoubtedly bring interesting new results esp. concerning NW African species of the genus.

SOUHRN

Autoři rozdělují rod *Deverra* DC. (syn. *Pituranthos* Viv.) na podkladě analýzy morfologických i anatomických znaků a rozšíření jednotlivých druhů do tří sekcí:

1. sect. *Deverra* zahrnuje nejvíce druhů, a to zejména v severní a severozápadní Africe. Její zástupci se vyznačují průduchy uloženými rovnoběžně s podélnou osou lodyhy. Plody jsou v obrysu okrouhlé až široce vejčité, nanejvýš o málo delší než široké, chlupaté až papilnaté, rýhy jsou zpravidla mělké a široké. Sekce zahrnuje tyto druhy: *D. battandieri* (MAIRE) CHRTEK, OSBORNOVÁ et ŠOURKOVÁ; *D. chlorantha* COSSON et DURIEU s.l.; *D. fallax* BATT. et TRABUT; *D. intermedia* CHEVALL.; *D. reboudii* COSSON et DURIEU; *D. rohlfiana* ASCHERSON; *D. scoparia* COSSON et DURIEU s.l.; *D. tortuosa* (DESF.) DC.

2. sect. *Deverraria* DC. je omezena na jižní a jihozápadní Afriku a její zástupci se vyznačují příčným uložením průduchů na lodyze. Plody jsou v obrysu široce vejčité, nanejvýš o málo delší než široké, chlupaté nebo papilnaté, se zřetelnými žebry. Do sekce patří pouze dva druhy: *D. aphylla* (CHAM. et SCHLECHT.) DC. a *D. burchellii* (DC.) ECKLON et ZEYHER.

3. sect. *Musilia* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ je rozšířena v Egyptě, Jordánsku, Izraeli a v Saúdské Arábii. Průduchy jsou příčné až šikmo uložené na lodyze; plody se výrazně liší od plodů u ostatních sekcí: jsou úzce vejčité až podlouhlé v obrysu, 2–3 × delší než široké, vždy hustě chlupaté. Žebra a rýhy na příčném řezu plodem výrazně vystupují. Sekce zahrnuje *D. triradiata* HOCHST. ex BOISS., a stenoendemický druh *D. musilii* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ.

Zástupci rodů rostoucí v Egyptě a v přilehlých územích byly studovány zevrubněji. Na podkladě sběrů a terénních zkoumání a studia herb. materiálu (CAI, PR, PRC) autoři rozlišují dva poddruhy druhu *D. tortuosa*: subsp. *tortuosa* s hustě, zdánlivě dichotomicky větvenými lodyhami (rostliny ± kulovitého tvaru) a subsp. *arabica*, jejíž větve jsou vzpřímenější (rostliny metlovitého vzhledu). Subsp. *tortuosa* se vyskytuje v Libyjské poušti, zatímco subsp. *arabica* roste pouze v Arabské poušti a na pobřeží Rudého moře. *D. triradiata* se vyskytuje v Egyptě, Izraeli a v Jordánsku. Tomuto druhu nejbližší *D. musilii* je popisována podle sběrů A. MUSILA ze Saúdské Arábie. *D. musilii* se liší od *D. triradiata* především charakterem oděru plodů a představuje druh, který zasahuje nejdál na východ z celého rodu.

Je uveden též klíč k určování druhů rodu *Deverra* z Egypta a přilehlých území. Další studium rodu, zejména v severozápadní Africe, ještě slibuje nové zajímavé výsledky.

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See also plates VII—X in the Appendix



HERBARIUM INSTITUTI BOTANICI UNIVERSITATIS
CAROLINAE - PRAHA

Habitat: Egypt,
Wadi Natrun

d. 1. m. 5. 1936 leg. Chrtěk, Hanko

1936 288 10 0

Fig. 1. — *Deverra tortuosa* (DESF.) DC. subsp. *tortuosa*.

J. Chrtěk, J. Osbornová et M. Šourková:
Notes on the genus *Deverra* (*Umbelliferae*)

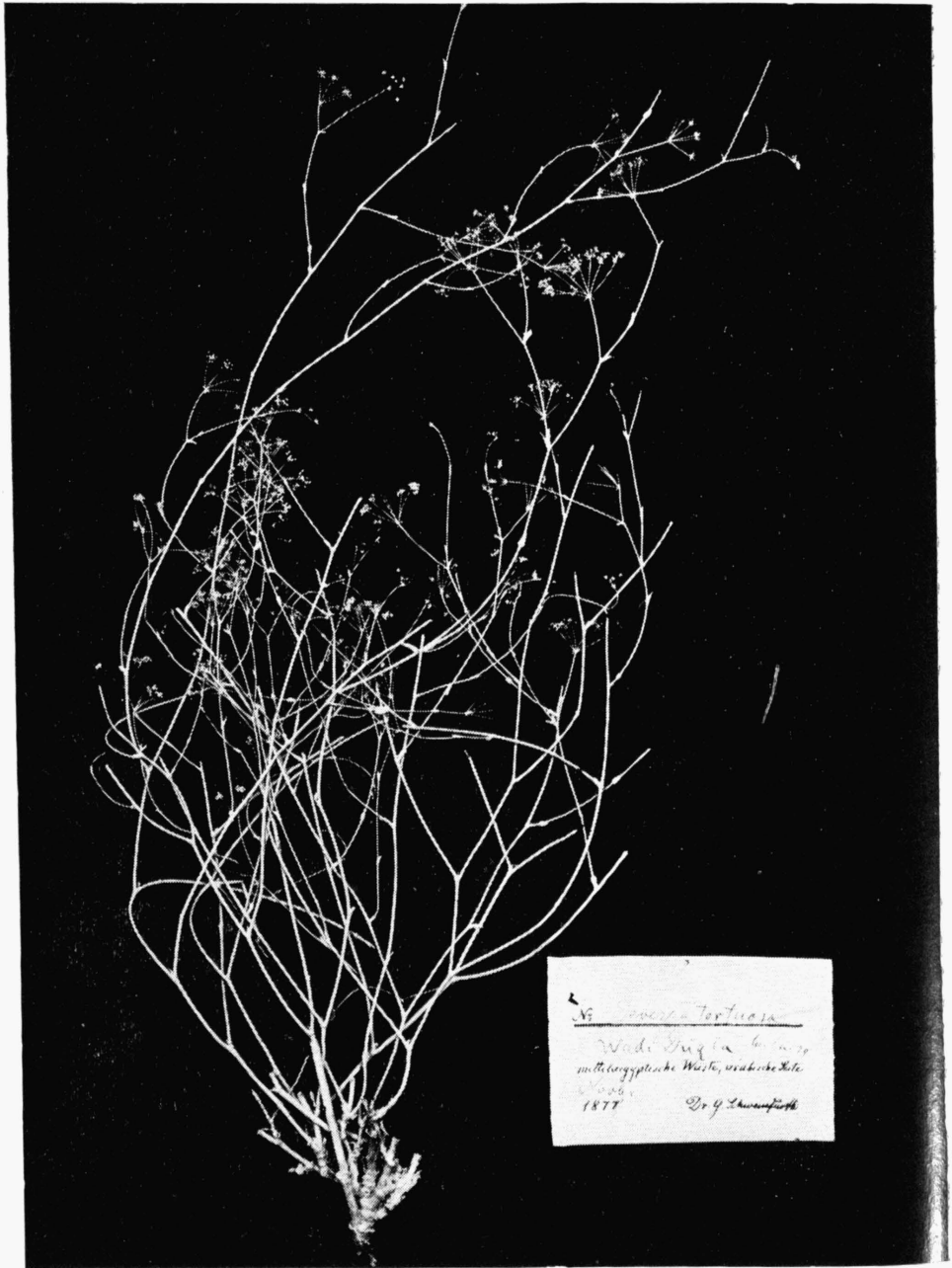


Fig. 2. — *Deverra tortuosa* (DESF.) LC. subsp. *arabica* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ. — Typus.

J. Chrtek, J. Osbornová et M. Šourková:
Notes on the genus *Deverra* (*Umbelliferae*)

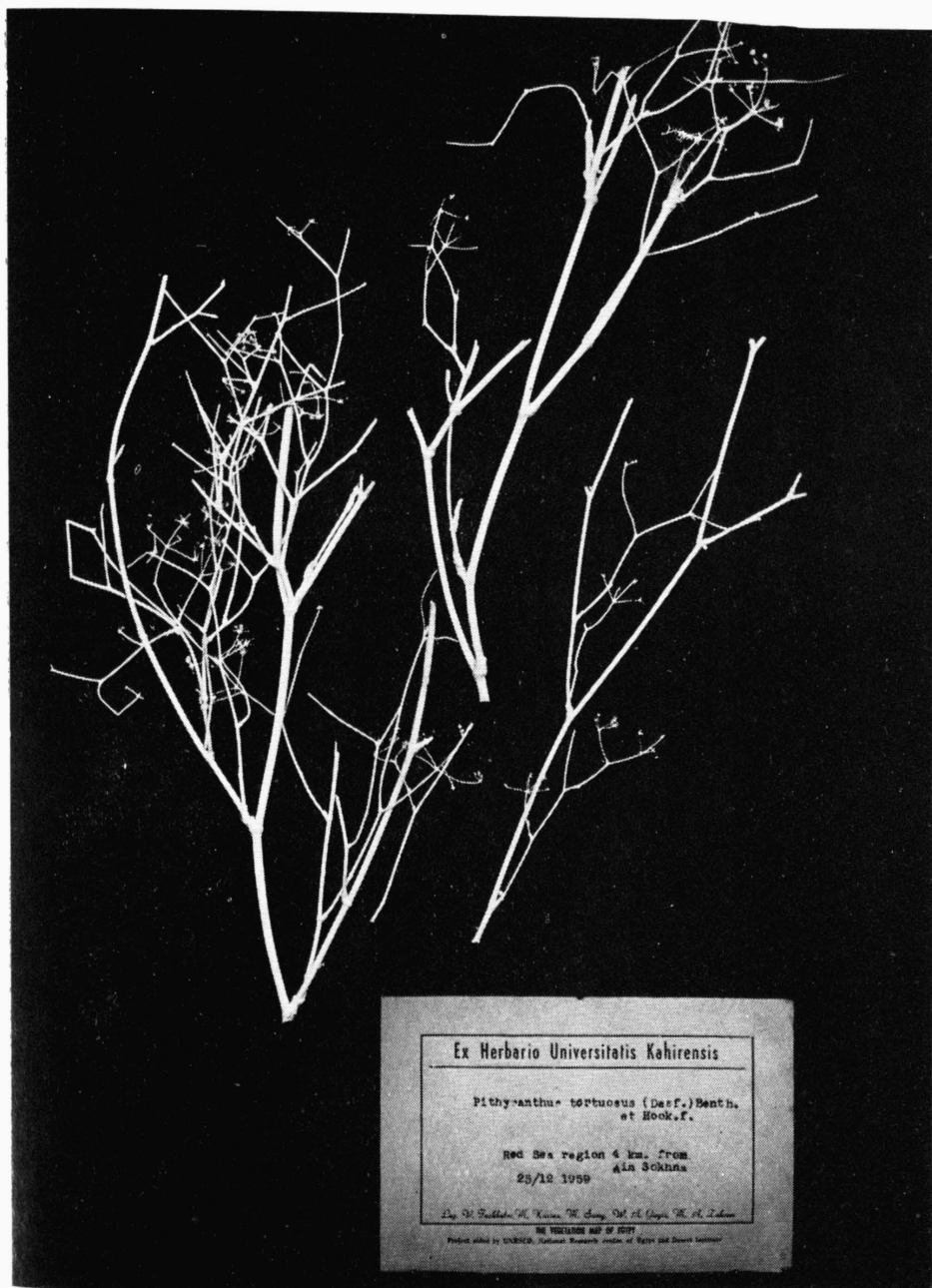


Fig. 3. — *Deverra tortuosa* (DESF.) DC. subsp. *arabica* CHRTEK, OSBORNŮVÁ et ŠOURKOVÁ.

J. Chrtek, J. Osbornová et M. Šourková:
Notes on the genus *Deverra* (Umbelliferae)

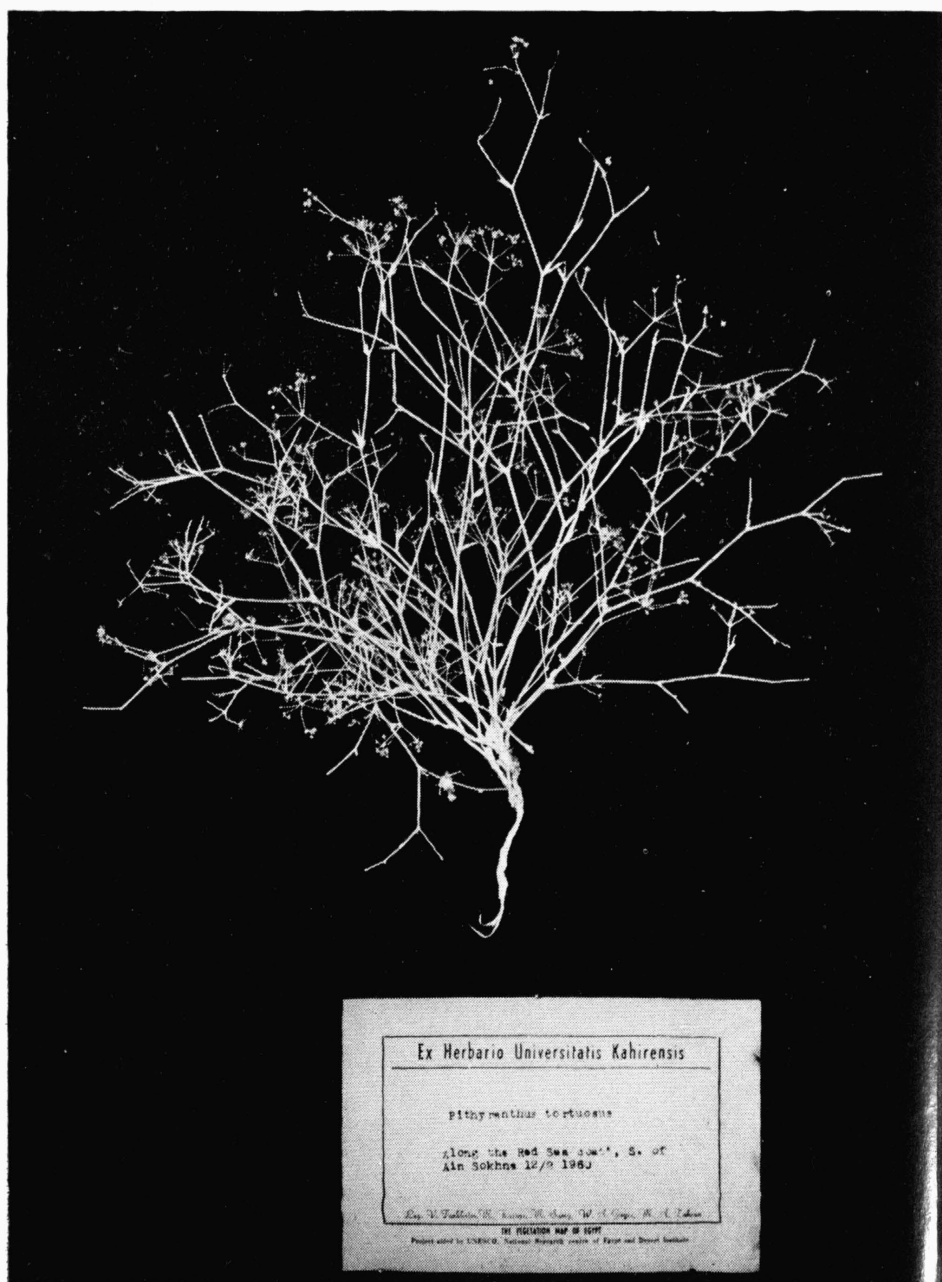


Fig. 4. — *Deverra tortuosa* (DESF.) DC. subsp. *arabica* CHRTEK, OSBORNOVÁ et ŠOURKOVÁ.

J. Chrtek, J. Osbornová et M. Šourková:
Notes on the genus *Deverra* (*Umbelliferae*)