

Zeitschrift:	Candollea : journal international de botanique systématique = international journal of systematic botany
Herausgeber:	Conservatoire et Jardin botaniques de la Ville de Genève
Band:	43 (1988)
Heft:	1
Artikel:	A contribution to the flora of Kuwait. 2
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DOI:	https://doi.org/10.5169/seals-879742

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A contribution to the flora of Kuwait. 2

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RÉSUMÉ

BOULOS, L. & V. ARMER (1988). Une contribution à la flore du Kowait. 2. *Candollea* 43: 285-292. En anglais, résumés français et anglais.

Onze espèces de phanérogames nouvelles pour la flore de Kowait sont présentées, dont la présence de neuf espèces est confirmée et la détermination d'une espèce est corrigée.

ABSTRACT

BOULOS, L. & V. ARMER (1988). A contribution to the flora of Kuwait. 2. *Candollea* 43: 285-292. In English, French and English abstracts.

Eleven species of flowering plants are reported new to the flora of Kuwait, the occurrence of nine species is confirmed, and the identification of one species is corrected.

Introduction

In the recently published "Flora of Kuwait", Vol. 1 (DAOUD & AL-RAWI, 1985) and Vol. 2 (AL-RAWI, 1987), some species which were recorded from Kuwait by previous authors, e.g. BURTT & LEWIS (1949, 1952, 1954), DICKSON (1955), HALWAGY & MACKSAD (1972), DICKSON & MACKSAD (1973), were either left out or enumerated at the end of the corresponding genus or family under the subtitle "also mentioned". This way of presenting such taxa gives the impression to the users of the Flora that they are dealing with doubtful records, especially as these are neither included in the keys, nor treated in any detail. In the present paper, the occurrence of nine of these species in Kuwait is confirmed by specimens previously or recently collected and examined by us. Furthermore, eleven species are recorded new to the flora of Kuwait, of which six are desert plants and five are weeds. The identification of one species is corrected.

The following is an annotated list of these species alphabetically arranged under their families.

AMARANTHACEAE

Amaranthus graecizans L., Sp. Pl., ed. 1, 990 (1753). New to the flora of Kuwait.

Runoff along the highway near Ahmadi, 24 April 1987, Nilsson, Halwagy & Boulos 16430 (KTUH).

This species is generally "classified" as a weed. However, its occurrence in a "desert" locality among other desert plants may be attributed to the neighbouring urban area of Ahmadi where many gardens are located. Moreover, the runoff where it was collected apparently received substantial amounts of water which provided suitable conditions for its growth as a weed.

Amaranthus hybridus L., Sp. Pl., ed. 1, 990 (1753) subsp. **hybridus**. New to the flora of Kuwait.

Runoff along the highway near Ahmadi, 24 April 1987, *Nilsson, Halwagy & Boulos 16433* (KTUH).

The same discussion would hold true for *Amaranthus hybridus* as for *A. graecizans* being a weedy species in a desert community.

ASCLEPIADACEAE

Calotropis procera (Willd.) R. Br., in Aiton, Hort. Kew., ed. 2: 78 (1811). Occurrence in Kuwait confirmed.

Kuwait City: waste ground near Hilton Hotel, 3 March 1987, *Boulos & Al-Hasan 16373* (KTUH); Al-Nuzha, 3 June 1987, *Azza Al-Musallam* s.n. (KTUH); University Campus at Khalidiya, one young plant observed, not collected (left to set flowers and fruits), May 1987. Fantas, 10 November 1935, *V. Dickson 266* (K).

DICKSON (1955) and DICKSON & MACKSAD (1973) enumerate *Calotropis procera* among the plants of Kuwait. However, DAOUD & AL-RAWI (1985) give no mention of this species. The above cited specimens, whether previously collected by Dickson in 1935 and examined by one of us, or collected in 1987, confirm its occurrence in Kuwait. This species is also known throughout Arabia, except in Qatar and Bahrain, being more widespread in the southern parts of the peninsula. RECHINGER (1970) gives its general distribution as such: southwest Asia, tropical and subtropical Africa.

BORAGINACEAE

Heliotropium kotschy (Bunge) Gürke, in Engl. & Prantl, Naturl. Pflanzenfam. 4, 3a: 95 (1893).
New to the flora of Kuwait.

Al-Khiran, by the Gulf shore, white sand, 27 November 1986, *Boulos, Rowaished & Gabali 16363* (KTUH); 12 February 1987, *Boulos 16370* (KTUH). *Heliotropium kotschy*, an abundant shrub growing on the white sands and sandstone, sometimes in pure extended stands, along the southern coastal area of Al-Khiran near the border with Saudi Arabia.

CARYOPHYLLACEAE

Vaccaria hispanica (Miller) Rauschert, Wiss. Zeitschr. Martin-Luther-Univ. Halle-Wittenberg, Math.-Naturwiss. Reihe 14: 496 (1965).

= *Vaccaria pyramidata* Medikus, Phil. Bot. 1: 96 (1789). Occurrence in Kuwait confirmed.

BURTT & LEWIS (1952) report the occurrence of this species (under *Saponaria vaccaria* L.) based on two localities from Kuwait: Al-Dehdihan, rare, late March 1933, *Dickson 119*; 1935, *Dickson 119A* (K! KTUH, photo). Failaka Island, 24 March 1936, *Dickson 119B* (K, KUTH, photo). DAOUD & AL-RAWI (1985) give no mention of this species, probably because it was not observed or collected after the above-mentioned records in the thirties when the plant was known to grow as a weed in corn fields (DICKSON, 1955). Corn is no longer cultivated in Failaka Island.

COMPOSITAE

Centaurea mesopotamica Bornm., Beih. Bot. Centralbl. 22: 170 (1906). Det. A. J. Grierson, 1986.
Occurrence in Kuwait confirmed.

Al-Khiran, near the chalets by the Gulf shore, 29 April 1982, *A. Rawi 11653* (KTUH); sandy soil, common, 21 April 1983, *A. Rawi & Students AR 2273* (KTUH). Crossroads between road to Saudi Arabia and Khiran, 10 March 1983, *A. Rawi & H. El-Kholy 11949* (KTUH). Al-Nuwaisib, near the frontier with Saudi Arabia, 3-4 km from the Gulf shore, coarse sandy soil, alt. 15 m,

28°35'N, 48°25'E, 8 March 1985, *Boulos & Al-Hasan 15463* (BR, CAIRC, E, KTUH). 1/2 km south of Al-Nuwaib Centre, towards the Saudi border, 3-5 km from the Gulf shore, 10 April 1986, *I. M. Ibrahim 10* (KTUH).

This species is cited by DICKSON (1955) and DICKSON & MACKSAD (1973). However, AL-RAWI (1987) lists it as a doubtful record. The occurrence of *Centaurea mesopotamica* is confirmed in Kuwait from several localities by the specimens recently collected and listed above.

Urospermum picroides (L.) Scop. ex F. W. Schmidt, Samml. Phys.-Ökon. Aufsätze, 1: 275 (1795).
New to the flora of Kuwait.

Kuwait City: garden weed, 5 April 1987, *I. M. Ibrahim* s.n. (KTUH).

According to MEIKLE (1985), this species is widespread in the eastern Mediterranean region and western Asia. Its occurrence in Kuwait is within its general geographical area.

CRUCIFERAE

Eremobium aegyptiacum (Sprengel) Aschers. & Schweinf. ex Boiss., Fl. Orient. Suppl. 30 (1888).
New to the flora of Kuwait.

Shagat Al-Huwamillyyah, N.W. of Kuwait, near the Iraqi border, on sand dunes, 18 March 1987, *S. Zaman*, s.n. (KTUH).

According to the collector, the plant is locally abundant on the sand dunes.

CYPERACEAE

Cyperus rotundus L., Sp. Pl., ed. 1, 45 (1753). Occurrence in Kuwait confirmed.

Kuwait City: Adeliyah Garden, 8 October 1962, *A. Macksad & M. D. Kernick M-277* (KTUH); Omariya Agricultural Research Station, 11 September 1985, *Boulos 15697* (CAIRC, KTUH); 28 September 1986, *Boulos 16189* (KTUH); University Campus at Khaldiya, on lawns, 14 October 1986, *Boulos 16217* (KTUH).

DICKSON & MACKSAD (1973) recorded *Cyperus rotundus* from Kuwait. However, AL-RAWI (1987) lists it among the doubtful species. The occurrence of *Cyperus rotundus* is confirmed by the specimens listed above; it is one of the most common summer weeds in the country (BOULOS, 1988).

GRAMINEAE

Hordeum murinum L., Sp. Pl., ed. 1, 85 (1753) subsp. **glaucum** (Steudel) Tzvelev, in Act. Nov. Sist. Vysshikh Rast. 8: 67 (1971).

= *Hordeum glaucum* Steudel, Syn. Pl. Glum. 1: 352 (1854). Occurrence in Kuwait confirmed.

Wadi Arar, 4 April 1972, *H. S. Daoud 689-72* (KTUH). Al-Subiyah, facing Bubyan Island, coarse maritime sand, near the Gulf shore, alt. 0-5 m, 29°35'N, 48°05'E, 21 March 1985, *Boulos 15511* (KTUH). Umm-Al-Rimam, a closed water catchment "feidh", coarse-grained sandstone and limestone, alt. 70-80 m, 29°30'N, 47°45'E, 1 March 1985, *Boulos & Al-Hasan 15251* (KTUH). Jal-Az-Zor Valley, 20 March 1972, *H. S. Daoud 379-72* (KTUH); at the top of Jal-Az-Zor, in sandy water channels, 1965, *A. Macksad & M. D. Kernick 283* (KTUH). Jahra, 1 March 1970, *H. S. Daoud 18-70* (KTUH). Sulaibikhat road, by the sea, 21 March 1982, *A. Rawi, R. Jalili & V. Armer 11083* (BR, CAIRC, E, K, KTUH, RNG, US). Wadi Al-Batin, 134 km from Reggae, alt. 198 m, 29 March 1982, *A. Rawi, R. Jalili & V. Armer 11307* (KTUH); Wadi Al-Batin, a garden near Kian western border, 27 March 1982, *O. J. Salmeen 11234* (KTUH). Al-Wafra, weeds in cultivated land, farm of Mandil El-Grahs, alt. 120 m, 28°35'N, 48°E, 28 March 1985, *Boulos & Al-Hasan 15558*

(KTUH). Runoff along the coastal highway to Al-Nuwaisib facing Al-Ahmadi Port, loose sandy soil, alt. 20 m, 29°05'N, 48°05'E, 7 March 1985, *Boulos & Al-Hasan* 15324 (KTUH). Failaka Island, east side, 19 April 1982, *A. Rawi* II584 (KTUH).

HALWAGY & MACKSAD (1972) and DICKSON & MACKSAD (1973) enumerate this species (under *H. glaucum*) among the plants of Kuwait. AL-RAWI (1987) refers to it under "also mentioned", etc. Plate 337 in Al-Rawi, l.c., refers to *Hordeum murinum* subsp. *glaucum* and not to *H. distichon* which is a cultivated species. *Hordeum murinum* subsp. *glaucum* is probably the most widespread grass in Kuwait; it grows as a weed in waste and cultivated ground, along roadsides, as well as in open deserts and wadis (BOULOS, 1988).

Lolium multiflorum Lam., Fl. Franc. 3: 621 (1778). Det. T. A. Cope, 1987. New to the flora of Kuwait.

Runoff along the coastal highway to Al-Nuwaisib, facing Al-Ahmadi Port, loose sandy soil, alt. 20 m, 29°05'N, 48°05'E, 7 March 1985, *Boulos & Al-Hasan* 15301 (BM, BR, CAIRC, E, KTUH, S).

This species is normally growing as a weed, but in this particular locality it was found among other desert plants near the urban area of Ahmadi, a similar case to that of *Amaranthus graecizans* and *A. hybridus* from the same locality collected two years later.

Trisetaria linearis Forsskål, Fl. Aegypt.-Arab. 27 (1775). Det. T. A. Cope, 1987. Occurrence in Kuwait confirmed.

Sobiyah, by the sea shore, 3 km to the right side of the police station, 7 April 1983, *B. Sheikh & A. Mohamed* AR 1934, 12295 (KTUH).

According to COPE (1985) *Trisetaria linearis* is recorded from Arabia only in Kuwait. However, AL-RAWI (1987) gives no mention of this species. Its occurrence in Kuwait is confirmed by the above specimen as well as by others in Kew Herbarium.

LABIATAE

Lallemandia royleana (Benth.) Benth., in DC. Prodr. 12: 404 (1848). New to the flora of Kuwait.

Wadi Al-Batin, between Hazil & Al-Shagaya, on the edge of a water course, 14 March 1976, *H. S. Daoud* 64-76 (KTUH); 131 km from Kuwait City, along Salmy road, 15 km into the desert, on the right, behind the oasis of Al-Shagaya, shallow calcareous soil, 6 March 1983, *A. Rawi & H. El-Kholy* II997 (KTUH).

This species is recorded from Saudi Arabia by DICKSON (1955). According to MOUTERDE (1979), it is known from Syria, Iraq, Iran, Afghanistan, Baluchistan and Central Asia. The distribution of *Lallemandia royleana* may be extended on the basis of herbarium specimens examined in Kew Herbarium to include: Southern Sinai, Southern Jordan and Oman. Therefore, our species is now known in the Arabian peninsula from Kuwait, Saudi Arabia and Oman.

LEGUMINOSAE

Ononis reclinata L., Sp. Pl., ed. 2, 1011 (1763). Det. B. Verdcourt, 1983. Occurrence in Kuwait confirmed.

Al-Khiran, 21 April 1983, *A. Rawi & Students* AR 2001 (KTUH).

The only species of *Ononis* given by Al-Rawi (1985) from Kuwait is *O. serrata* Forsskål. However, TOWNSEND (1974) lists Kuwait among the countries where *O. reclinata* occurs. The above specimen confirms its occurrence in Kuwait.

Prosopis farcta (Banks & Sol.) Macbride, in Contr. Gray Herb., N.S. 59: 17 (1919). Occurrence in Kuwait confirmed.

Kuwait City: Omariya Agricultural Research Station, waste ground, 26 October 1986, *I. M. Ibrahim*, s.n. (KTUH).

Prosopis farcta is listed by DICKSON (1955) and DICKSON & MACKSAD (1973) among the plants of Kuwait. TOWNSEND (1974) lists Kuwait among the countries where this species occurs. However, DAOUD & AL-RAWI (1985) give no mention of its occurrence in Kuwait. The above recently collected specimen confirms its occurrence in Kuwait. The plant was also observed in some other localities in Kuwait city.

Vicia sativa L., Sp. Pl. ed. 1, 736 (1753). New to the flora of Kuwait.

Kuwait City: growing in a garden as a weed, 15 April 1987, *Y. Al-Yahya* 153 (KTUH). According to TOWNSEND (1974), *Vicia sativa* is a widespread species in Europe, Mediterranean, Asia; naturalized in tropical Africa, Australia, New Zealand and elsewhere.

LILIACEAE

Bellevalia saviczii Woron. in Izv. Glavn. Bot. Sada 26: 614 (1927). Det. R. D. Meikle, 1981.

Replaces *Bellevalia flexuosa* Boiss. in Flora of Kuwait 2: 286 and plate 318 (1987).

Sobiyah, by the sea, alt. 6 m, 22 March 1982, *A. Rawi* 11163A (KTUH); Sobiyah, behind the police station, 10 April 1983, *A. Rawi* 12348 (BR, KTUH); Sobiyah, on the sea shore, coarse gravelly sand, alt. 5 m, 5 March 1982, *V. Armer* 10912 (KTUH); Sobiyah, by the sea shore, alt. 1 m, 1 March 1981, *A. Rawi*, *R. Jalili* & *V. Armer* 10101 (KTUH). Failaka Island, behind the museum, 3 km from the port, 24 February 1983, *A. Rawi* & *H. El-Kholy* 11878 (KTUH).

According to FEINBRUN-DOTHAN (1986), *Bellevalia flexuosa* is known from the East Mediterranean (Palestine, Lebanon, Syria); its occurrence in Kuwait is therefore considered doubtful. On the other hand WENDELBO (1985) gives the following geographical distribution for *B. saviczii*: South and Northeast Iran, Afghanistan, Pakistan and Central Asia (Turkmenia and Southwest Tadzhikistan). Our species, apart from being identified by Mr. R. D. Meikle as *B. saviczii* fits more to the area of its distribution, than to that of *B. flexuosa*.

RUBIACEAE

Galium tricornutum Dandy, in Watsonia 4: 47 (1957). Det. D. Bridson & L. Boulos, 1987. New to the flora of Kuwait.

Ten km west of Al-Jahra, along the highway to Saudi Arabia, sandy soil, alt. 100 m, 29°20'N, 47°35'E, 21 February 1985, *Boulos & Al-Hasan* 15083 (KTUH).

This is the first species of the genus *Galium* ever recorded from Kuwait. According to EHREN-DORFER & SCHONBECK-TEMESY (1980), *G. tricornutum* is common in Iraq in the forest zone, steppe region and on the alluvial plain in the desert region. They add that its general distribution is: West, Central and South Europe, Crimea, Southwest Russia, Palestine, Turkey, Caucasus, Iran, Central Asia (Turkmenia), Kashmir, Tibet, North Africa; elsewhere introduced. Its occurrence in Kuwait seems to fit into its general distribution, especially as it is known to be common in the desert region of Iraq.

SOLANACEAE

Hyoscyamus muticus L., Mant. 1: 45 (1767). Occurrence in Kuwait confirmed.

Rhawdatain, 14 January 1970, *A. Macksad* s.n. (KTUH).

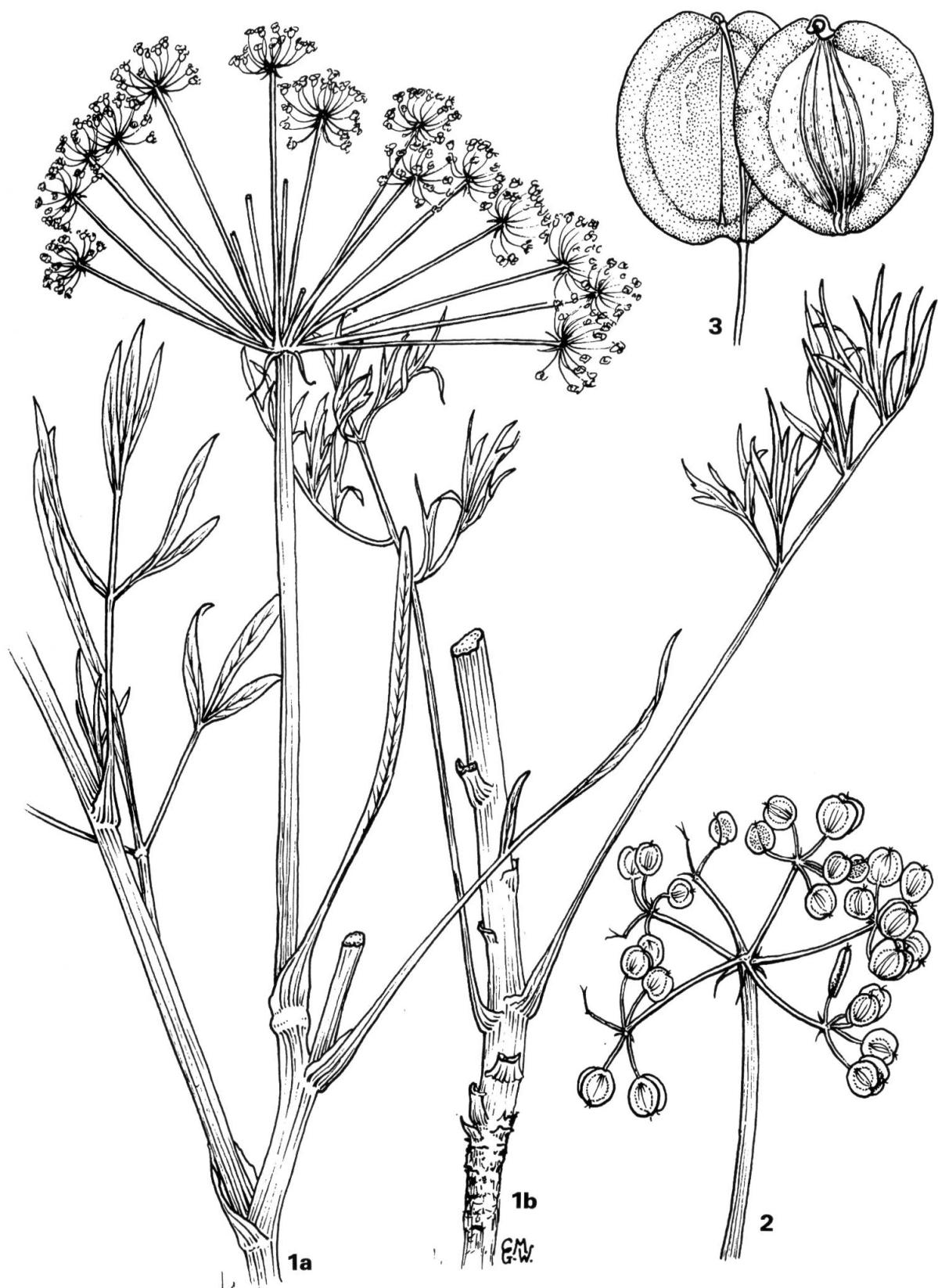


Fig. 1. — *Ducrosia anethifolia* (DC.) Boiss.
1a, b, habit ($\times 0.8$); 2, fruiting umbel ($\times 0.8$); 3, fruits ($\times 4.8$).

DICKSON & MACKSAD (1973) enumerate *Hyoscyamus muticus* among the plants of Kuwait, apparently based on the above specimen collected by Macksad in 1970. AL-RAWI (1985) does not refer to this species even among the doubtful records. The occurrence of *H. muticus* in Kuwait is confirmed by the above specimen.

UMBELLIFERAE

Anisosciadium isosciadium Bornm., Repert. Sp. Nov. 10: 468 (1912). Det. Edinburgh Herbarium, May 1985. New to the flora of Kuwait.

136 km along the Salmi highway from Rikka at the Iraqi-Saudi border, alt. 200 m, 13 April 1981, A. Rawi, R. Jalili & V. Armer 10656 (E, KTUH, RNG).

ZOHARY (1972) described the general distribution of *Anisosciadium isosciadium* as Saharo-Arabian. Specimens of this species deposited in Kew Herbarium are from the deserts of Syria, Palestine, Jordan and Iraq. TOWNSEND (1964) writes: "A. isosciadium is confined (in Iraq) to the southern and western desert areas of Iraq...". Its occurrence in Kuwait fits into its general distribution and represents the southernmost area of its geographical range.

Ducrosia anethifolia (DC.) Boiss. in Ann. Sci. Nat. Ser. 3, 1: 341 (1844). New to the flora of Kuwait (Fig. 1).

Al-Khiran, 20 March 1971, H. S. Daoud 198-71 (KTUH); Al-Khiran, on the side of the road, near the chalets, 2 May 1973, H. S. Daoud 43-73 (KTUH); Al-Khiran, 15 April 1976, Fatma A. Abdullah, s.n. (KTUH); 21 April 1983, L. M. Al-Mesaed AR 2002 (KTUH); Al-Khiran, by the Gulf shore, white sand, 27 November 1986, Boulos, Rowaished & Gabali 16360 (KTUH); 12 February 1987, Boulos 16369 (KTUH). Wadi Al-Batin, 17 April 1975, M. I. Bajwa 1288-75 (KTUH). Al-Shagaya, 22 March 1975, M. O. Al-Diraini, s.n. (KTUH); 4 km south of Al-Shagaya, 2 km east of Wadi Al-Batin, on the edge of the wadi, 14 April 1983, A. Rawi 12410 (KTUH). Burgan, 3 April 1976, M. Al-Saif s.n. (KTUH).

Ducrosia anethifolia is known from United Arab Emirates, Saudi Arabia, Iraq, Iran and Afghanistan. This information is based on the specimens deposited in Kew Herbarium. Kuwait is now the third country in the Arabian peninsula where this species is known to occur.

ACKNOWLEDGEMENTS

This work was supported by the Research Grant SO 029 from the Research Management Unit of Kuwait University. Thanks are due to the Keeper of the Herbarium, Royal Botanic Gardens, Kew for facilities given during summer 1987; the help offered by the members of staff of the Herbarium and Library is most appreciated. Miss Pat Halliday kindly read the manuscript.

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