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A new species of the genus *Torilis* Adanson (Apiaceae)

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JURY, S. L., 1987. **A new species of the genus *Torilis* Adanson (Apiaceae).** The name *Torilis nodosa* (L.) Gaertner has been shown to have been used to include two very distinct variants. *Torilis nodosa* is therefore typified, and the other variant described as a new species.

ADDITIONAL KEY WORDS:—fruit morphology – mericarp morphology – nomenclature – taxonomy – Umbelliferae.

CONTENTS

INTRODUCTION

Torilis nodosa (L.) Gaertner was originally described by Linnaeus as *Tordylium nodosum* L. in *Species plantarum*: 240 (1753). It was transferred to the genus *Caucalis* L. by Scopoli in the second edition of his *Flora carniolica* (1772: 192), and to *Torilis* Adanson by Gaertner in *De fructibus et seminibus plantarum* (1788: 82). Although older Flora writers seem to have had difficulties, there is now no problem in defining these genera, for they can all be easily characterized by readily observable fruit characters, (Heywood & Dakshini, 1971; Jury, 1978a). At present the genus *Torilis* contains ten species (Heywood & Jury, 1978), although a number of infraspecific taxa are recognized.

Considerable confusion can arise in certain situations where the fruits do not develop spines but become tuberculate, an occurrence discussed elsewhere (Jury 1978a, b, 1986). This has even resulted in new genera being described, e.g. *Ammiopsis* Boiss. with *A. daucoides* (Salzm. ex DC) Boiss. for a variant of *Daucus aureus* Desf. with spineless, tuberculate fruits (July, 1987b). However, in *Torilis nodosa* either the plants have all mericarps spiny, or the umbels contain both

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spiny and tuberculate mericarps. (The umbels are sessile, borne at the nodes and have three very short rays, giving rise to the English name of Knotted Hedge-parsley (Dony, Jury & Perring, 1986).) The inconspicuous umbels have a few small, all-hermaphrodite flowers, containing non-radiating petals, short stamens and styles, and are characteristic of inbreeders in the Umbelliferae (Owens, 1974; Jury, 1986). It is only the flowers around the periphery of the umbel that are heterocarpic with the outer mericarp spiny and the inner tuberculate; all the central flowers have the same tuberculate mericarps. It is an interesting observation that the ripe spiny mericarps are easily removed, whereas the tuberculate ones remain firmly attached for a long time: a fact painfully realized when cleaning the 'seed' of this species! The spiny mericarps presumably serve for animal dispersal to new areas, whilst the tuberculate ones maintain the existing population.

The heterocarpic state also occurs not infrequently in several infraspecific taxa of *Torilis arvensis* (Hudson) Link, where normally all mericarps are spiny.

Meikle (1977: 700) followed Thellung (1926: 1059) in recognizing these mericarp variants of *T. nodosa* as different forms, but noted: "Further investigations may show that *T. nodosa* f. *homoeocarpa* deserves a higher rank". This paper provides evidence for separation at the specific level.

DIFFERENCES BETWEEN THE TWO *TORILIS NODOSA* VARIANTS

It is now apparent that in *T. nodosa*, unlike *T. arvensis*, there are a number of distinct character differences which correlate with the two fruit variants. These are summarized in Table 1, and illustrated in Fig. 1.

Seeds of both variants were sown in the greenhouses of Plant Science Laboratories, University of Reading with a view to carrying out hybridization experiments. These proved impossible as the spiny homocarpic variant quickly produced a shoot which started to flower at 5 cm tall, while the other produced a distinct rosette. By the time the heterocarpic variant had started to flower, the spiny homocarpic one had fruited and died! Later attempts also failed and this led to an examination of the voucher specimens for previous chromosome

Table 1. Differences between the two *Torilis nodosa* variants

Heterocarpic variant	Spiny homocarpic variant
Plant produces a basal rosette of leaves before sending out several flowering stems	Plant does not produce a basal rosette of leaves, but runs straight up into flower when very young. Plants finish flowering and are in fruit before the heterocarpic variant flowers
Leaves usually 2- to 3-pinnate	Leaves usually 1- to 2-pinnate
Peduncles 2–5(–30) mm long	Peduncles 3–10(–30) mm long
Chromosome number, $2n = 24$	Chromosome number, $2n = 22$
Distribution: widespread in western, central and southern Europe, south-west Asia and eastwards to Central Asia, North Africa. Widely introduced elsewhere	Distribution: Mediterranean and Middle East, occurring in southern Portugal, southern Spain, Balearic Islands, Sicily, Cyprus, Turkey, Israel, Iraq, Iran, North Africa and the Canary Islands. See Fig. 2.

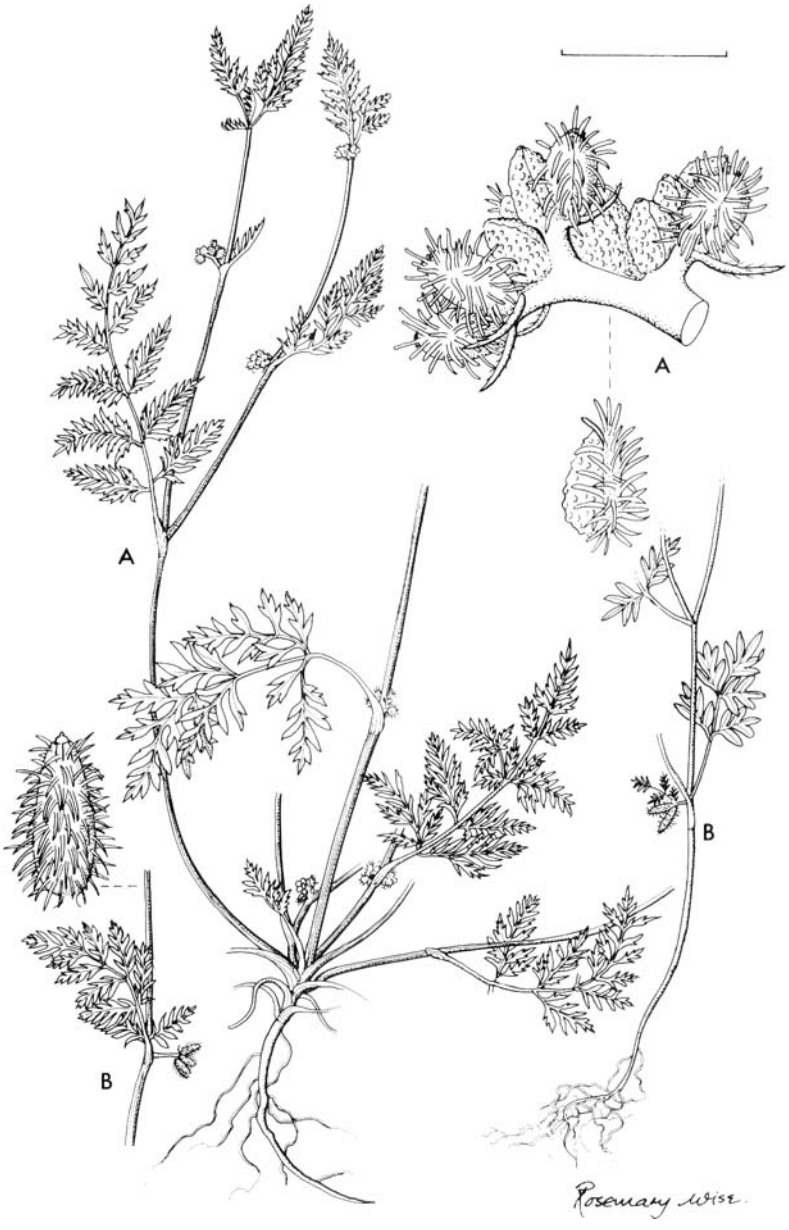

Figure 1. Habit of *Torilis nodosa*. A. The heterocarpic and B. the spiny homocarpic variant. Scale bar = 40 mm, except enlargements of fruits = 5 mm.

counts, see Cauwet-Marc & Jury (1978). A count of $n = 11$, and two of $2n = 22$ are referable to the spiny homocarpic variant, while two other counts of $n = 12$ to the heterocarpic one. So far, I have only seen specimens from Greece of the heterocarpic variant, and the four counts of $2n = 24$ by Engstrand (1970) from this country are presumably also of this variant.

The leaves of the two variants are different, as can be seen in Fig. 1, with the heterocarpic one 2- to 3-pinnate and the spiny homocarpic only 1- to 2-pinnate.

The length of the peducle is very variable in both variants. Fraser (1928) noted for a heterocarpic specimen: "The pedunculate form is not very constant in the same colony, nor on the same plant in my herbarium". It is completely useless as a diagnostic taxonomic character and is partly dependent on the age of the plant, and Meikle (1977: 700) is misleading in giving "Umbels subsessile" for f. *nodosa* and "Umbels distinctly pedunculate (peduncles exceeding 2 cm in length)" for f. *homoeocarpa* Thellung (the all-spiny mericarp variant).

The distribution of both variants is clearly confused by them becoming widely naturalized. However, the heterocarpic variant has a much more northern range than the Mediterranean and Middle-Eastern spiny homocarpic one, see Fig. 2.

TYPIFICATION

Linnaeus very clearly described the heterocarpic variant of *Torilis nodosa* as *Tordylium nodosum* from France and Italy: "TORDYLIUM umbellis simplicibus sessilibus, seminibus exterioribus hispida". However, he was incorrect in giving "umbellis simplicibus": the umbels are invariably three-rayed. Linnaeus's description was changed from "Caucalis umbellis sessilibus simplicibus" in *Hortus Cliffortianus*: 91 (1738).

There are two specimens in the Linnean Herbarium (LINN) at Burlington House: 336.6, which appears to be a syntype, and 336.7, almost certainly a post-1753 addition (C. E. Jarvis, personal communication). The specimen on sheet 336.6 is a good representative specimen of the heterocarpic variant with short peduncles and is here designated the lectotype of *Torilis nodosa* L. The other specimen, sheet 336.7, although also a heterocarpic variant, has rather unusually large leaves with broad segments, 5 mm wide, and long peduncles

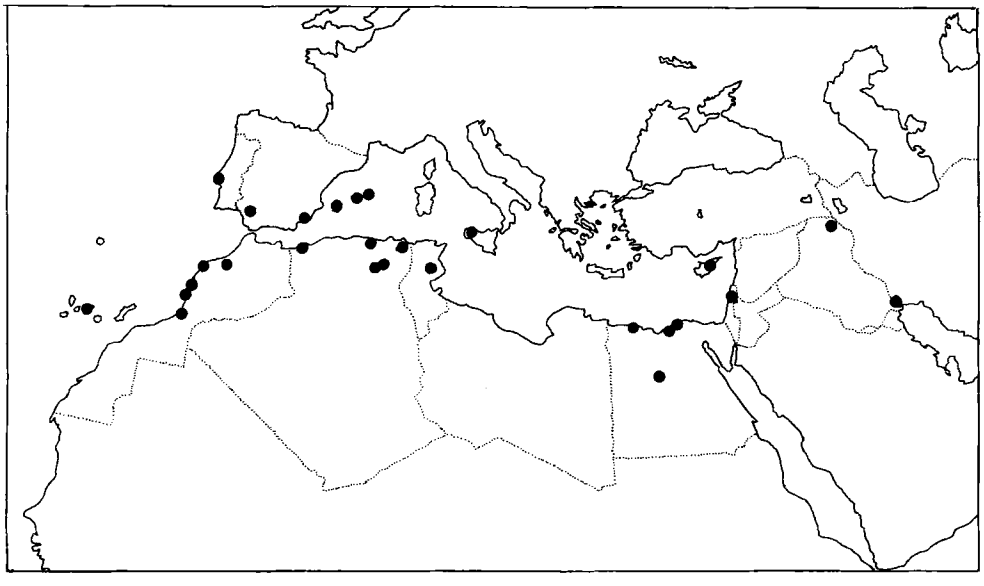

Figure 2. Distribution of the spiny homocarpic variant, described as a new species.

15 mm long. It does fall within the variation exhibited by the species, but does not exemplify the specific characteristics well.

Several names exist for the other spiny homocarpic variant. Murbeck (1897) published *Torilis nodosa* var. *bracteosa* (Bianca) Murbeck, based on Bianca's name *Torilis bracteosa* on the label of an herbarium specimen: "Bianca in HUET Pl. sic, exs. 1856 n. 100 pro sp.". Unfortunately, this specimen, namely "Sicilia, in ruderatis et ad vias Arola, *E. & A. Huet de Pavillon 100,* 19 iv 1856", in the Kew Herbarium (K) is the typical heterocarpic variant with shortly pedunculate umbels, even though Murbeck clearly describes the spiny homocarpic one. Lojacono Pojero (1891: 307) adds a note after his description of *Torilis nodosa* to say that *T. bracteosa* Bianca does *not* differ by its bracts and umbels. Bianca's name was also reduced to a subspecies by Nyman (1879: 282). Meikle (1977: 700) says: "It is questionable if *Torilis bracteosa* Bianca (in Att. Accad. Gisenia Sci. Nat., Catania, ser. 2, 3:31; 1846), the basionym of Murbeck's var. *bracteosa*, is the same plant as described above". However, the series of articles by Bianca in that Journal on the Sicilian flora contain no mention of *Torilis bracteosa*, and it remains a *nomen nudum*. Meikle (personal communication) is now completely unaware of the source of this erroneous reference. I believe this name can and should be passed over.

Caucalis fallax Boiss. & Bl. var. *brevipes* Boiss. was described by Boissier (1872: 1086) for the spiny homocarpic variant.

Torilis nodosa f. *longipedunculata* Porta & Rigo *in sched.* is typified by a Spanish specimen: "Regn. Murcicum, in pascuis maritimis ad Cartagenam, *Porta & Rigo 699,* 18 v 1891" (BM!), which is also referrable to the spiny homocarpic variant. As long peduncles exist in both spiny homocarpic and the heterocarpic variants, this name is also best passed over in favour of a new one at a different rank, to avoid confusion.

Thellung (1926: 1059) published *two* infraspecific classifications for *T. nodosa*, one based on vegetative morphology and one on fruit characters. In the latter classification he published f. *homoeocarpa*, referrable to the spiny homocarpic variant. Because of his anomalous treatment giving two classifications, I again prefer to describe the species under a new name, rather than simply change the status and make a new combination.

DESCRIPTION

Torilis webbii S. L. Jury, **sp. nov.**

DERIVATION: The species is named after Professor D. A. Webb in honour of his long and distinguished contribution to the study of the European and Mediterranean floras.

SYNONYMS: *Caucalis fallax* Boiss. & Bl. var. *brevipes* Boiss., *Fl. Orient., 2*: 1086 (1872).

Torilis nodosa (L.) Gaertner subsp. *bracteosa* (Bianca) Nyman, *Consp. fl. eur.*: 282 (1879).

Torilis nodosa (L.) Gaertner var. *bracteosa* (Bianca) Murbeck, *Contrib. Fl. Nord.-Ouest Afr., 1*: 84 (1897), *excl. syn.*

Torilis nodosa (L.) Gaertner f. *longipedunculata* Porta & Rigo, *Iter hisp., 3.n.*: 699 (135) (1891).

Torilis nodosa (L.) Gaertner f. *homoeocarpa* Thellung in Hegi, *Ill. Fl. von Mittel-Europa, 5(2)*: 1059 (1926).

A *Torilis nodosa* differt floribus in statu juvenile productis, nunquam foliis basalibus rosulam formantibus; foliis a 1- ad 2- (non 2- ad 3-) pinnatisectis; ambis mericarpiis semper spinosis. Chromosomatum numerus $n = 11$ vice 12.

Differs from *Torilis nodosa* in flowering when very young and not forming a basal rosette; leaves 1- to 2-, rather than 2- to 3- pinnatisect; both mericarps always spiny. Chromosome number $n = 11$ instead of 12.

TYPE: Morocco (WS), Cap Beddouza, cliffs to N of lighthouse, 30 m 32°45'N, 9°15'W, rock crevices, *Reading University/British Museum (Natural History) Expedition to Morocco [C. J. Humphries, S. L. Jury, M. Mullin & I. B. K. Richardson] 103*, 1 vi 1974 (Holotype BM; Isotypes E, I.A.V. Hassan II, Rabat & MO).

Spreading, decumbent or prostrate annual, 5–50 cm; stems little branched, scabrid with retrorse hairs; internodes long. Leaves oblong-deltoid in outline, 2–8(–15) cm long, 1- to 2-pinnate, segments ovate, deeply pinnatifid, lobes linear-lanceolate. Umbels leaf-opposed, 1–2 cm in diameter, subsessile or shortly pedunculate; rays obscure, 3, occasionally up to 1 cm long. Bracts absent; bracteoles 2–5 mm long, exceeding the subsessile flowers. Sepals obsolete or reduced to minute subulate-deltoid lobes. Petals white or pink, 0.5–0.8 mm long, 0.3–0.6 mm wide. Styles short, usually less than 0.5 mm long. Fruits small, 2–3 mm long, ovoid. All the mericarps with numerous spines with retrorsely barbed apices on the secondary (vallecular) ridges; primary ridges with hairs pointing towards the stylar end. $2n = 22$.

REPRESENTATIVE SPECIMENS EXAMINED:

EUROPE: PORTUGAL: Arredores de Lisboa, Serra da Monsanto, *Cunha 1133*, iv 1887 (BM). SPAIN: Regn. Murcicum, in pascuis maritimis ad Cartagenam, *Porta & Rigo 699*, 18 v 1891 (BM). BALEARIC ISLANDS: Mallorca, Portalls Vells, *J. F. M. & M. J. Cannon 3695*, 6 iv 1971 (BM); Menorca, beside road to Es Grao and La Albufera, NW of Mahon, Fields near Algarrobet, 45 m, *Bowden & Sims 798*, 3 iv 1967 (BM). SICILY: In arvis sterilibus Palermo, *Todaro*, v 1887 (BM, K).

ORIENT: CYPRUS: Kyrenia, coast maquis, *Atherton 1327*, 21 iv 1956 (K); Near Ayios Amurosios, roadside by coast, *Meikle 4031*, 30 iii 1974 (K). TURKEY: Cilicie, Buisson, montagne au sud d'Anamour, *Péronin 35*, v 1872 (BM, K). IRAN: 2 km SW Khurraumbar, 5000', *Cowan & Darlington 483*, 8 iv 1929 (K). IRAQ: Qaranjir, 900m, *Rawi & Gillett 7549*, 14 iv 1947 (K); Shaqlawa, 1000m, *Rawi & Gillett 11,572*, 1 vi 1948 (K). ISRAEL: Acre, *Meinertzhagen*, 5 iv 1933 (BM). EGYPT: El Wedi near El Saff, *Simpson 677*, 13 iii 1922 (K); Lieux d'isserts Alexandria, Kralik, 9 iii 1847 (K).

NORTH AFRICA: LIBYA: Cyrenaica, Bersis, *Guichard CYR/93/58*, 11 iii 1958 (BM); Farfara Oasis, *Ascherson 739*, 22 ii 1874 (K). TUNISIA: In agris hordeaceus ad Sidi-Boul-Baba prope Gabis, *Kralik 69*, 16 iv 1894 (BM, K). ALGERIA: Biskra, *Chevallier 578*, v 1904 (K); Lac des Oiseaux, about half-way between Annaba

(Bone) and El Kala, 5–10 m, *Davis 52243*, 12 v 1971 (BM, RNG). MOROCCO: 16 km S of Rabat, Temara-Plage, 5 m, *Miller, Russell & Sutton 117* (BM, RNG); Tiznit, bank of Oued Massa, 20 km N of Tiznit, *Bramwell, Richardson & Murray 381*, 29 iii 1972 (K, RNG).

ATLANTIC ISLANDS: CANARY ISLANDS: Tenerife, Bajamar to Punta del Hidalgo, *J. F. M., M. J. & P. F. Cannon 4353* (BM); Oratava, La Dehesa, *Lowe*, iii 1858 (K).

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I wish to thank Dr J. R. Akeroyd for reading and commenting on the manuscript, and Dr C. E. Jarvis for helping with the typification. A very special word of thanks goes to Professor D. A. Webb who, when the original version of the paper was read at a conference of the Botanical Society of the British Isles in Manchester in April 1979 (see Jury, 1980) proposed that I "should drink a glass of 'Bull's Blood' and makes these two variants species".

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