

Torilis pseudonodosa Bianca (Apiaceae) – new species for the flora of Ukraine

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We report the first record of *Torilis pseudonodosa* Bianca (Apiaceae) from Ukraine. It was found on 28th of May 2021 in the “Potiivska” section of the Black Sea Biosphere Reserve near the village of Zaliznyi Port (Southern Ukraine). *Torilis pseudonodosa* previously was known from various countries in the Mediterranean Basin and Western Asia, but not from Ukraine nor elsewhere in Eastern Europe. We discovered a hitherto unknown population of *Torilis pseudonodosa* during the 15th EDGG Field Workshop, an international expedition of the Eurasian Dry Grassland Group (EDGG) taking place in Southern Ukraine, from 23 May to 2 June 2021. We present the taxon, its morphology and general distribution, describe its first Ukrainian site ecologically and coenologically and provide photos of the site and the species. The species occurred in a saline steppe, close to the Black Sea coast. The vegetation was dominated by *Agropyron pectinatum* and *Halimione verrucifera*, with *Artemisia santonica*, *Festuca callieri* agg., *Milium vernale* and *Vicia hirsuta* as subdominants. The classification of the saline steppe of the “Potiivska” section of the Black Sea Biosphere Reserve near is problematic, because species composition represents a mixture of steppic and halophytic plants. A definitive decision would require comprehensive phytosociological analyses. Since there was no indication of anthropogenic influence at the site, we assume that *Torilis pseudonodosa* reached it as a result of natural migration of its propagules (e.g. with birds). Thus, the species can be considered as nonsynanthropic in the flora of Ukraine.

Key words: new find, migration, Black Sea Biosphere Reserve, Mediterranean region



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Повідомляємо про першу знахідку *Torilis pseudonodosa* Bianca (Apiaceae) в Україні. Знайдено 28 травня 2021 року в районі «Потіївської» ділянки Чорноморського біосферного заповідника, поблизу села Залізний Порт (Південь України). *Torilis pseudonodosa* раніше був відомий для різних країн Середземноморського басейну та Західної Азії, але не наведений для України чи інших місць Східної Європи. Нами виявлено невідому досі популяцію *Torilis pseudonodos*, а під час 15-тої польової робочої групи EDGG, міжнародної експедиції Євразійської Степової Групи (EDGG), що проходила на Півдні України з 23 травня по 2 червня 2021 року. Наведено таксон, його морфологію та загальне поширення, описано екологічно та ценологічно його перший український локалітет та надано фотографії місцязнаходження та виду. Вид зустрічався на засоленому степу поблизу узбережжя Чорного моря. У рослинності переважали *Agropyron pectinatum* і *Halimione verrucifera*, з *Artemisia santonica*, *Festuca callieri* agg., *Milium vernale* та *Vicia hirsuta*, як субдомінанти. Класифікація солоного степу ділянки «Потіївська» поблизу Чорноморського біосферного заповідника є проблематичною, оскільки видовий склад являє собою суміш степових та галофітних рослин. Для остаточного висновку знадобиться комплексний фітосоціологічний аналіз. Оскільки жодних ознак антропогенного впливу на території об'єкта не було, ми припускаємо, що *Torilis pseudonodosa* потрапив до нього в результаті природної міграції його пропагул (наприклад, з птахами). Таким чином, вид можна вважати несинатропним у флорі України.

Ключові слова: нова знахідка, міграція, Чорноморський біосферний заповідник, Середземноморський регіон

МОЙСИЕНКО И.И., УМАНЕЦЬ О.Ю., ДЕНГЛЕР Ж., ГУАРИНО Р., ДЕМБІЧ И., КУЧЕР О.О., СКОБЕЛЬ Н.О., БЕДНАРСКАЯ И.А. (2021). *Torilis pseudonodosa* Bianca (Apiaceae) – новый вид для флоры Украины. *Черноморск. бот. ж.*, 17 (4): 331–338. doi: 10.32999/ksu1990-553X/2021-17-4-3

Сообщаем о первой находке *Torilis pseudonodosa* Bianca (Apiaceae) в Украине. Найден 28 мая 2021 года в районе «Потиевского» участка Черноморского биосферного заповедника, близ села Железный Порт (Юг Украины). *Torilis pseudonodosa* ранее известен для разных стран Средиземноморского бассейна и Западной Азии, но не приведен для Украины или других мест Восточной Европы. Нами обнаружена неизвестная до сих пор популяция *Torilis pseudonodos*, во время 15-й полевой рабочей группы EDGG, международной экспедиции Евразийской Степной Группы (EDGG), которая проходила на Юге Украины с 23 мая по 2 июня 2021 года. Приведены таксон, его морфология и общее распространение, описан экологически и ценологически его первый украинский локалитет и предоставлены фотографии местоположения и вида. Вид встречался на засоленной степи у побережья Черного моря. В растительности преобладали *Agropyron pectinatum* и, с *Artemisia santonica*, *Festuca callieri* agg., *Milium vernale* и *Vicia hirsuta* как субдоминанты. Классификация соленой степи участка «Потиевская» вблизи Черноморского биосферного заповедника проблематична, поскольку видовой состав представляет собой смесь степных и галофитных растений. Для окончательного вывода потребуется комплексный фитосоциологический анализ. Поскольку никаких признаков антропогенного воздействия на территории объекта не было, мы предполагаем, что *Torilis pseudonodosa* попал к нему в результате природной миграции его пропагул (например, с птицами). Таким образом, вид можно считать несинатропным во флоре Украины.

Ключевые слова: новая находка, миграция, Черноморский биосферный заповедник, Средиземноморский регион

Torilis pseudonodosa Bianca is a species of flowering plant from the family Apiaceae. The genus *Torilis* includes 16 species native to Eurasia and North Africa, but some of them

(e.g. *T. arvensis* (Huds.) Link.) occur as aliens in North America [DAVIS, 2001; HAND, 2011; HAND et al., 2011; MABBERLEY, 2017]. *Torilis pseudonodosa* previously was known from various countries in the Mediterranean Basin and Western Asia, but not from Ukraine nor elsewhere in Eastern Europe. On May 28th, 2021, we discovered an hitherto unknown population of *T. pseudonodosa* during the 15th EDGG Field Workshop, an international expedition of the Eurasian Dry Grassland Group (EDGG) taking place in Southern Ukraine, from 23 May to 2 June 2021. The plant was recorded in a 100 m² ‘biodiversity plot’ [DENGLER et al., 2016], which was sampled by Iwona Dembicz, Jürgen Dengler, Oksana Kucher and Ivan Moysiyyenko. The collected specimen was identified as *Torilis pseudonodosa* Bianca by another participant of the Field Workshop, Riccardo Guarino, co-author of “Flora d'Italia” [PIGNATTI et al., 2019–2021], who knew the species from Italy. The research confirmed that the new specimen is *Torilis pseudonodosa*, new to the flora of Ukraine. The aim of this paper is to describe the new locality of *Torilis pseudonodosa*, and to discuss the species status in Ukraine.

Materials and methods

The 15th EDGG Field Workshop took place from 24 May to 3 June 2021 in Southern Ukraine (Kherson and Mykolaiv administrative regions), focusing mainly on dry grasslands (desert steppes, bunchgrass steppes, saline and sandy grasslands), but also including in our survey other vegetation types: mesic grasslands, dunes and saline communities. We recorded a new vascular plant species for Ukraine – *Torilis pseudonodosa* Bianca during Field Workshop. It was discovered on May 28, 2021 on the territory of the Potiivska site of the Black Sea Biosphere Reserve in the EDGG Biodiversity Plot UAS20.

The collected specimens were later carefully studied in the laboratory of the Department of Plant Ecology and Environment Protection of the Kherson State University, and compared with all specimens of *Torilis nodosa* stored in the Herbarium of the M.G. Kholodny Institute of Botany National Academy of Science of Ukraine (KW).

Results

Torilis pseudonodosa was described in 1846 by the Italian botanist Giuseppe Bianca from Italy [BIANCA, 1846]. However, later this taxon has often been reported under other synonyms or was treated as a variety or subspecies of *Torilis nodosa*:

- = *Caucalis fallax* var. *brevipes* Boiss., Fl. 2: 1086 (1872)
- = *Torilis webbii* Jury, Bot. J. L. Soc. 95: 297 (1987)
- = *Torilis nodosa* subsp. *webbii* (Jury) Kerguelen, E. R. I. C. A. 10: 10 (1998)
- = *Torilis nodosa* f. *homoeocarpa* Thell., Hegi, Ill. Fl. Mitt.-Eur. 5(2): 1059 (1926)
- = *Torilis nodosa* f. *longipedunculata* Porta & Rigo, Iter Hispan. III 1891 no. 699 (135) (1891), insched.
- = *Torilis nodosa* subsp. *praecox*, nom. inval.

In the last decades, *Torilis pseudonodosa* has been considered as a distinct species by many authoritative references [BALIOUSIS, 2015; DIMOPOULOS et al., 2016; HAND, 2011; HAND et al., 2011; HASSLER, 2004–2021; IPNI, 2021; PIGNATTI et al., 2017–2019; TORILIS PSEUDONODOSA BIANCA IN GBIF SECRETARIAT, 2021; WORLD PLANTS, 2021; WCVF, 2021, etc].

Torilis pseudonodosa is similar to *Torilis nodosa*, but differs from the latter in having umbrellas with up to 4 cm long peduncles (*Torilis nodosa* has sessile or up to 5 mm pedunculate umbrellas); homocarpous fruits with long spines on each fruit (*T. nodosa* has only external fruits covered with long spines whereas internal fruits are covered with blunt small protuberances); leaves 1–2, rather than 2–3 pinnatisect and in at flowering time, not forming a basal rosette [DAVIS, 2001; PIGNATTI et al. 2017–2019] (Fig. 1).



Fig. 1. A sample of *Torilis pseudonodosa* from Potiivka.

T. pseudonodosa is known to grow in many habitat types, particularly in coastal disturbed sites and thermophilous coastal scrub; calcareous rocky places, clearings of *Pinus brutia* [DAVIS, 2001; HAND, 2011; HAND et al., 2011; HANSEN, SUNDING, 1993; PIGNATTI et al., 2017–2019; WORLD PLANTS, 2021].

The known distribution range of *T. pseudonodosa* covers the Mediterranean region from Spain to Turkey (Balearic Islands, East Aegean Islands Corsica, Greece, France, Spain, Sicily, Cyprus, Egypt, Morocco, Tunisia, Algeria, Canary Islands, Turkey and Israel) [DAVIS, 2001; HAND, 2011; HAND et al., 2011; HANSEN, SUNDING, 1993; PIGNATTI et al., 2017-2019; TORILIS PSEUDONODOSA BIANCA IN GBIF SECRETARIAT, 2021; WORLD PLANTS, 2021]. Furthermore, it was reported from Iraq, Iran and Egypt [HASSLER, 2004–2021; IPNI, 2021; WCVP, 2021].

The new locality of *Torilis pseudonodosa* (Fig. 1) was found near the village of Zaliznyi Port (Kherson region, Skadovsk district) on a territory of the “Potiivska” section of the Black Sea Biosphere Reserve (henceforth: BSBR), in the “biodiversity plot” US20SE (coordinates of the locality: N 46.133507°; E 32.229562°). The territory of the reserve is 109255 ha, among them 14820 ha of land and 94435 ha of water. The BSBR consists of several parts (sections), representative of as many different landscape units of the seaside in Southern Ukraine: azonal forest, sand steppe, desert steppe, grey and white coastal sand dunes, and sea solonchak. The “Potiivska” section has area of 1064 ha [UMANETS, 2012]. Its area is flat and due to low elevation above sea level it is periodically flooded by sea water. Chestnut soil is the main soil type in the Section, while the dominant vegetation type is a saline steppe (table 1).

Torilis pseudonodosa occurred approximately 300 m from the Black Sea coastline, in a saline steppe community (Fig. 2). Only a few dozen individuals were observed in the plot and nearby.

Soil analysis showed that the soil, within the plot UAS20 in which *T. pseudonodosa* was found, was a sandy loam (with about 70 % of sand, 20 % of silt and 10 % of clay). The soil pH was slightly basic (pH \approx 7.8), its carbon content was almost 3 % and content of carbonates was 0.83 %. Dominant species there were *Agropyron pectinatum* (60 % cover) and *Halimione verrucifera* (40 %). Subdominant plants represented by *Festuca callieri* agg. (10 %), *Milium vernale* (5 %), *Vicia hirsuta* (5 %) and *Artemisia santonica* (3 %). The classification of the saline steppe of the “Potiivska” section of the Black Sea Biosphere Reserve is problematic, because species composition represents a mixture of steppic and halophytic plants. A definitive decision would require comprehensive phytosociological analyses.

Discussion

This is the first published record of *Torilis pseudonodosa* from Ukraine, but also from the whole of Eastern Europe. Most likely, *Torilis pseudonodosa* appeared in the BSBR only recently, because this territory undergoes regular and accurate monitoring of flora and vegetation – thus it is unlikely that the species was overlooked before. *T. pseudonodosa* grew in a natural community in the BSBR, thus we suppose that the species probably migrated there in naturally, e.g. the propagules of the species could have been transferred by birds.

This hypothesis is supported by the fact that regularly new nonsynanthropic plants of Mediterranean origin have been detected in this region. In particular, quite recently on the island Tendrivska Spit, which directly borders with the “Potiivska” section of the BSBR, the following species previously unknown from the region were found: *Cerastium tauricum* Spreng., *Clypeola jonthlaspi* L., *Echinophora sibthorpiana* Guss., *Elytrigia striatula* (Runemark) Holub, *Glaucium flavum* Crantz, and *Medicago marina* L. [UMANETS, 2000; UMANETS, 2009].

These species could have migrated on that island from Crimea (geographically the closest known occurrences), as well as from Turkey or other Mediterranean countries.



Fig. 2. The saline steppe community near the Black Sea coastline where *Torilis pseudonodosa* was found. Photo Ivan Moysiyenko.

Table 1

Vegetation table of the relevés with *Torilis pseudonodosa* in Southern Ukraine

Plot NO		UAS20			
Autors		Iwona Dembicz, Jürgen Dengler, Oksana Kucher, Ivan Moysiyenko			
Date		28.05.2021	Stones and rocks	0	
(m2)		100	Gravel	0	
Elevation m a.s.l.		-2	Fine soil	100	
Orientation°		0	Vegetation total	90	
Inclination°		0	T: Tree layer	0	
Aspect°		0	S: Shrub layer	0	
Litter		95	H: Herb layer	90	
Dead wood		0	C: Cryptogam layer	0	
Latitude		46.133507°	Longitude	32.229562°	
№	SPECIES NAME	Cover	№	SPECIES NAME	Cover
1	<i>Agropyron pectinatum</i>	55	15	<i>Pastinaca clausii</i>	0,25
2	<i>Halimione verrucifera</i>	37,5	16	<i>Trifolium retusum</i>	0,1
3	<i>Festuca callieri agg</i>	17,5	17	<i>Lamium amplexicaule</i>	0,055
4	<i>Vicia hirsuta</i>	5	18	<i>Trifolium arvense</i>	0,055
5	<i>Artemisia santonica</i>	3,5	19	<i>Veronica arvensis</i>	0,0505
6	<i>Milium vernale</i>	3	20	<i>Apera maritima</i>	0,05
7	<i>Vicia tetrasperma</i>	2,5	21	<i>Valerianella carinata</i>	0,05
8	<i>Trifolium campestre</i>	1,1	22	<i>Torilis pseudonodosa</i>	0,0025
9	<i>Bromus squarrosus</i>	0,6	23	<i>Valerianella pumila</i>	0,005
10	<i>Crepis ramosissima</i>	0,6	24	<i>Vicia sordida</i>	0,005
11	<i>Elytrigia repens</i>	0,5	25	<i>Cerastium ucrainicum</i>	0,0005
12	<i>Vicia angustifolia</i>	0,5	26	<i>Cruciata pedemontana</i>	0,0005
13	<i>Galium spurium</i>	0,35	27	<i>Galatella villosa</i>	0,0005
14	<i>Limonium gmelinii</i>	0,3			

As a matter of fact, the records of *Elytrigia striatula*, which is unknown in Crimea and of *Echinophora sibthorpiana*, which has not been found in Crimea since 40 years, because the only population went destroyed in 1975–1978 [YENA, 1994, 2009, 2012, 2015], clearly indicate that not only Crimea could be a donor of new species.

For instance, *Echinophora sibthorpiana* also occurs in Romania and Bulgaria [YENA, 2009] and probably the plant migrated to Tentrivska Spit island from there [UMANETS, MOYSIYENKO, 2017]. *Torilis pseudonodosa* could have migrated to the the BSR from the Mediterranean region, where the closest known occurrences are in Turkey and Greece [DAVIS, 2001; HAND, 2011–2021]. Thus, we suppose that *Torilis pseudonodosa* in Ukraine is a nonsynanthropic plant species, which recently migrated to the studied locality by natural means.

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