

New taxa and chorological data for the flora of Bulgaria.

DIMITER DELIPAVLOV

31 Svoboda blvd., Plovdiv 4002, Bulgaria.

DELIPAVLOV D. (1998): New taxa and chorological data for the flora of Bulgaria. – Thaiszia – J. Bot. 8: 121-128. – ISSN 1210-0420.

ABSTRACT: The article reports taxa new for the science and the flora of Bulgaria. *Oenothera bulgarica* sp. n. and *Gagea villosa* var. *stenophylla* var. n. are new for the science. The following 3 species and 1 subspecies are new for the flora of Bulgaria: *Xeranthemum inapertum* (L.) MILL., *Gagea heldreichii* (A. TERRACC.) LOJAC, *Bellevalia sarmatica* (PALL. ex GEORGI) WORONOW and *Kickxia spuria* (L.) DUMORT. subsp. *spuria*. New chorological data are given for the remaining taxa.

Keywords: *Oenothera bulgarica* sp. n., flora of Bulgaria, chorology

As part of the Bulgarian - Swiss programme for investigating the biological diversity in Bulgaria, some regions of the Rhodope mountains and the Kaliakra reserve on the northern Black Sea coast were visited several times. Together with this, determining herbarium materials collected earlier from other regions of the country, some taxa new for the science and the country were found out, as well as new chorological data ascertained for some plants rare for the flora of Bulgaria. An investigation concerning some taxa was made in the Sofia and Plovdiv herbaria. The materials collected by us are kept at the Herbarium of the Plovdiv Faculty of Agronomy.

Notholaena maranthae (L.) Desv. - Middle Rhodope. On rocks and rocky places above the Bachkovo monastery, to the left of the path leading to the locality of Klouvijata. Materials with spores were collected on 16.06.1995. The habitat is comparatively big for the flora of Middle Rhodope.

According to AKHTAROV (1963, p. 136) *N. maranthae* is found in the Middle Balkan Mountains - in the region of the town of Kalofer and Mt. Shipka, Southern Rila - above the village of Boboshevo (Kiustendil district), Pirin, Belasitza, Eastern Rhodope and Strandja. STOYANOV, STEFANOV & KITANOV (1966, p. 22) report *N. maranthae* for "Western and Middle Balkan Mountains, Rila, above Boboshevo, Belasitza, Pirin, Pazardjik district, Harmanli district and Strandja."

Fumaria thuretii BOISS. - Thracian plain. On grassy places on the hills above the left bank of the Maritza river near the town of Lyubimetz, Haskovo district. Plants with flowers and immature fruit were collected on 27.05.1993.

Up to the moment, this species was known only from the Strandja mountain (YORDANOV & KOZHUHAROV 1970, p. 303; STOYANOV, STEFANOV & KITANOV, 1966, p. 439).

Euphorbia villosa WALDST. & KIT. - Middle Rhodope. On wet places in thinned forests and shrubs, as well as along forest roads. Plants with flowers and immature fruit were collected on 25.06.1988 along a forest road above Narechenski bani, Assenovgrad region.

According to KUZMANOV (1979, p. 124-125). *E. villosa* is known in Bulgaria from "the Danube plain, the Predbalkan, the region of Znepole, the Struma valley, Sredna Gora, the Thracian plain and Strandja". STOYANOV, STEFANOV & KITANOV, 1967, p. 687) report the same regions with the exception of Strandja.

The species is new for the flora of the Rhodope.

***Oenothera bulgarica* DELIP., sp. n.**

E sect. *Oenothera*, subsect. *Munzia* W. DIETR.

Herba biennis, rosulata erecta vel prostrata. Caulis simplex vel ramosus 40-80 (-110) cm alt., 0.25-0.40 cm in diam. Planta tota strigulosa et dense pubescens. Folia rosularia lineari-spathulata vel oblongo-spathulata, subintegra, tempore florendi ± sicca, 2.5-7.0 cm lg. et 0.3-0.6 cm lt., apice angustata basin versus in petiolum, 1.5-3.0 cm lg. attenuata, quadrante superiore latissima; folia infima (caulina) lineari-spathulata, inconspicue remote emarginata 2.5-7.5 cm lg. et 0.3-0.4 cm lt., apice acuminata, basi in petiolum ± alatum, 0.5-1.5 cm lg. angustata etiam in quadrante superiore latissima; folia media cultrata vel lanceolata, remote dentata et tum ± undulata, basi rotundata, sub medium latissima, apice angustata et ± acuminata, 3.0-6.5 cm lg. et 0.3-0.8 cm lt.; suprema media similis sed gradatim decrescentia et in bracteis transeuntia, basi ± semiamplexicaulia, dentata, undulata, 3.0-5.5 cm lg. et 0.3-0.6 cm lt. Bractea anguste triangularia vel anguste ovata semiamplexicaulia, remote dentata, undulata, acuminata, 2.5-3.5 cm lg. et 0.3-0.5 cm lt. Inflorescentia simplex, rarius ramosa. Tubus floralis 0.6-1.0 cm lg.; gemmae 0.4-0.7 cm lg. et 0.3-0.5 cm crassae, ambitu oblongo-ellipticae vel ovatae, virides, junctura sepalorum tubo florali roseo fasciatae; apices sepalorum erecti vel divergentes, 0.1-0.2 cm lg.; petala rosea, rotundata

vel rotundato-obovata, basi brevi unguiculata, 0.6-0.8 cm lg. et 0.5 -0.7 cm lt.; filamenta rosea, 0.5 - 0.8 cm lg.; anthera flava 0.25 - 0.40 cm lg.; stylus 0.5-0.7 cm lg.; ovarium 1.5-1.8 cm lg. Capsula cylindrica 1.5-3.5(-4.0) cm lg. et 0.3-0.4 cm crassa. Semina elliptica vel anguste elliptica 0.15-0.17 cm lg. et 0.06-0.07 cm crassa.

Typus: Bulgaria austro-occidentalis. In graminosis saxosis prope vic. Strumesnitza, cca 120 m s. m., Petric district, in societate cum *Chrysopogon gryllus*, *Poa angustifolia*, *Festuca* sp., *Silene frivaldskiana*, *Convolvulus canthabricus*, *Petrorhagia prolifera*, *Allium margaritaceum*, *Achillea clypeolata*, *Anthemis tinctoria*, *Echinops sphaerocephalon* et a.

Leg. D. Delipavlov 03.06.1987. (Herbarium facultatis agronomicae Plovdiv, Bulgaria, № 47691 holo).

Affinitas. *Oenothera parodiana* MUNZ., subsp. *parodiana* cui proxima est proportione bracteis capsulae etiam forma et dimensione bracteis etc. bene differt (Fig. 1).

It is interesting to note that from the habitat in Strumeshnitza we collected flowering plants while the plants grown in Plovdiv for a number of years never opened their flowers - the sepals remained coalesced in their upper part under the apices. In spite of this they regularly gave fruit with vital seeds.

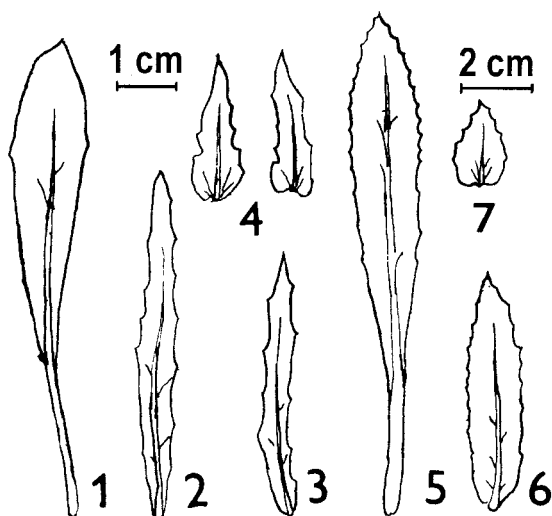


Fig. 1. *Oenothera bulgarica* DELIP. sp. n. (1-4); *Oenothera parodiana* subsp. *parodiana* (Argentina, Córdoba, CONRAD & DIETRICH). After DIETRICH 1977, p. 460. (5-7). – 1. rosette leaf, 2-3. cauline leaves, 4. bracts, 5. rosette leaf, 6. cauline leaf, 7. bract.

Materials from *O. bulgarica* were given to Prof. WERNER DIETRICH from the Institute of Botany at the University of Duesseldorf, Germany. He is an expert on the *Oenothera* genus and was kind enough to send me publications of his, including the monograph on the *Oenothera* genus. The materials I sent him were determined by him as *O. parodiana* Munz subsp. *parodiana*. I express my thanks for the assistance given.

The species described by us differs from *O. parodiana* subsp. *parodiana* mostly in the ratio between bracts and fruit. Besides, the bracts in both species differ in form as well. In *O. parodiana* subsp. *parodiana* they are oblong, broadly oblong or ovoid, 1-2 cm long and 0.8-1.2 cm wide (DIETRICH 1977, p. 564 and 566), while in *O. bulgarica* they are narrowly triangular or narrowly ovoid, 2.5-3.5 cm long and 0.3-0.5 cm wide. The indumentum is also different in the two species.

Phlomis herba-venti L. subsp. *pungens* (WILLD.) MAIRE ex DEFILIPPS var. *laxiflora* (VELEN.) ASSENOV - Eastern Rhodope. On grassy places along the border with the Republic of Greece, at the village of Slaveevo, Ivailovgrad region. Plants with flowers were collected on 19.06.1996.

STOYANOV, STEFANOV & KITANOV (1967, p. 904), as well as ASSENOV (1989, p. 419) do not report the var. *laxiflora* for the flora of the Rhodope.

Kickxia spuria (L.) DUMORT. subsp. *spuria* - Eastern Rhodope. On grassy places and among crops in the vicinity of Ivailovgrad. Plants with flowers were collected on 19.06.1996.

STOYANOV, STEFANOV & KITANOV (1967, p. 958) do not report subspecies taxa of this species, while MARKOVA (1955, p. 125) accepts that only subspecies *integrifolia* (BROT.) FERNANDES is found in Bulgaria. The materials collected by us confirm subspecies *spuria* which is new for the flora of Bulgaria.

Chamomilla suaveolens (PURSH) RYDB. - the Balkan foothill region. In the streets and along the river in the housing estate of Ostretz in the town of Apriltzi. Plants with flowers and immature fruit were collected on 13.07.1996.

A new species for the flora of the Balkan foothill region.

Xeranthemum inapertum (L.) MILL. - Northern Black Sea coast. On grassy places in the Kaliakra reserve, between the village of Balgarevo and Cape Kaliakra. Plants in flower were collected on 26.07.1997.

A new species for the flora of Bulgaria.

X. inapertum differs from *X. annuum* L. in its dimensions (10-40 cm high), the inner phyllaries (1.3-1.7 cm and not 1.7-2.5 cm long). Besides, they are pale red and not red, pointing obliquely upwards and not laterally curved. The fertile flowers in the inflorescence are 25-50 and not 70-120.

The distribution of *X. inapertum* is Southern Europe, Caucasia, Asia Minor, Lebanon, Cyprus and North-Western Africa. The habitats nearest to Bulgaria are in Greece and Turkey.

Steptorhamphus tuberosus (JACQ.) GROSSH. - Western Rhodope. On stony limy place above the left (western) bank of the Krichim Dam. Plants with flowers and immature fruit were collected on 04.07.1989.

STOYANOV, STEFANOV & KITANOV (1967, p. 1171) report this species for "the slopes of the Middle Rhodope (above the town of Assenovgrad), the southern part of the Black Sea coast, Strandja and the southern part of the Struma valley".

This species has not been reported up to this moment for the Western Rhodope.

Gagea peduncularis (J. & C. PRESL) PASCHER - Western Rhodope. On grassy places on limy terrain in the outskirts of the village of Ravnogor, Plovdiv district. Plants with flowers were collected on 13.05.1993.

According to HINKOVA (1964, p. 217) *G. foliosa* (DESF.) SCHULTES & SCHULTES fil. (= *G. peduncularis* (J. & C. PRESL) PASCHER) is found in "Etropole, Doupnitsa, Plovdiv, Pazardjik and Svilengrad." However, the author points out that "the distribution is given on reference data, since no materials from this species have been preserved in our herbaria".

According to STOYANOV, STEFANOV & KITANOV (1966, p. 207) *G. peduncularis* grows "among the shrubs and on the meadows of the Belassitza mountain." This is based on STOYANOV (1921, p. 77), who was the first to report this species for the flora of Bulgaria.

Having in mind that there are no materials from *G. peduncularis* in Bulgarian herbaria and that the plant has not been collected from Belassitza since 1921, we should therefore accept that the habitat at the village of Ravnogor (1250 m above sea level) is the only one in Bulgaria, as far as this species is concerned.

G. saxatilis (MERT. & KOCH) SCHULTES & SCHULTES fil. - 1. Southern Black Sea coast. On grassy places and beside bushes, to the north-west of Meden Roudnik housing estate, Bourgas. Plants with flowers were collected on 04.04.1987; 2. Middle Rhodope. On grassy and bushy places above the town of Assenovgrad: a) Along the path between Assenova krepost and the Loukovitza river. Collected with fruit on 10.03.1989. b) Along the path between Assenovgrad and the locality of Korou Dere. Collected in flowering on 07.03.1989 and on 16.03.1994; 3. The Thracian plain. In bushy places on the northern slope of the Hill of Youth in Plovdiv. Plants with flowers were collected on 03.03.1990 and on 18.03.1995, and with immature fruit - on 10.05.1993 and on 20.04.1995.

STOYANOV & STEFANOV (1924, I, p. 226) consider this taxon to be a subspecies of *G. bohémica* SCHULTES. In the following 3 editions (the last one in co-authorship with B. KITANOV) they mention only *G. bohémica*, without any subspecies taxa. HINKOVA (1964, p. 214) accepts the same viewpoint.

The materials collected by us show that this taxon has a significant distribution in Bulgaria, and its morphological differences give us grounds to accept the view point of contemporary authors and look upon this taxon as a species.

Gagea heldreichii (A. TERRACC.) LOJAC - the Struma valley. On grassy and bushy places along the border with the Republic of Greece, to the south of the village of

Razhdak, Petrich region. Plants with flowers and immature fruit were collected on 17.04.1964.

A new species for the flora of Bulgaria, whose distribution covers the Mediterranean, Asia Minor and Crimea. The habitats nearest to Bulgaria are in Crimea and Greece.

Gagea fistulosa (RAM.) KER-GAWLER - the Pirin mountain. On grassy places between the chalets of Banderitza and Vihren. Plants with flowers were collected by S. DIMITROV and D. DELIPAVLOV on 11.06.1970., and by D. DELIPAVLOV on 14.06.1995. This is the second habitat of this species in the Pirin mountain.

Gagea villosa (BIEB.) DUBY var. *prolifera* STER. - Thracian plain. On grassy places and among wheat crops in the vicinity of the villages of Markovo, Sinitevo and Miromir, Plovdiv district. Materials with flowers were collected on 18.03.1990 (Markovo), on 01.04.1994 (Miromir) and on 25.03.1994 (Sinitevo).

STOYANOV, STEFANOV & KITANOV (1966, I, p. 207) report the var. *prolifera* only for the region of Gabrovo and Sofia. HINKOVA (1963, I, p.217) does not mention the var. *prolifera* for the flora of Bulgaria.

***Gagea villosa* (BIEB.) DUBY, var. *stenophylla* DELIP., var. n.** Folia basalia anguste linearia, 15-20 cm lg. et 0.08-0.1 cm lt., caulina linearia vel lineari-lanceolata, apicem versus sensim acuminata, 3.5-5 cm lg. et 0.06-0.4 cm lt. **Typus:** In graminosis et in agris cca vic. Markovo. Plovdiv district, 190-200 m s. m. Leg.: D. DELIPAVLOV, 08.04.1984 (Herbarium facultatis agronomice, Plovdiv, Bulgaria, № 47692 holo).

Ornithogalum pyramidale L. - 1. The Balkan foothill region. On grassy places in the Ostretz housing estate, the town of Apriltzi, Lovech district. Plants with flowers and immature fruit were collected on 16.06.1997; 2. Eastern Phodope. On grassy places and beside crops along the border with the Republic of Greece, in the vicinity of the village of Slaveevo, Ivailovgrad district. Collected with flowers and immature fruit on 19.06.1996.

The investigations made in some Bulgarian herbaria showed that *Ornithogalum narbonense* L., known in Bulgaria to this moment, has been erroneously determined as such, instead of being determined as *Ornithogalum pyramidale* L. The differences between the two species are as follows: 1. The bracts of the inner flowers in *O. pyramidale* are twice longer than the pedicles, while in *O. narbonense* they are longer, rarely equal to or a little shorter than the pedicles; 2. The stylus in *O. pyramidale* is 0.1-0.2 cm, and not 0.28-0.35 cm long.

Bellevalia sarmatica (PALL. ex GEORGI) WORONOV. - Northern Black Sea coast, Kaliakra reserve. Materials with immature fruit collected on 13.06.1997. between the village of Bulgarevo and the archaeological reserve at Cape Kaliakra.

In the herbarium of the Biological Faculty at Sofia University "Kliment Ohridski" (SO) a *B. sarmatica* inflorescence is kept on sheet No 86285. The material was presented by B. KITANOV, who grew the plant from a bulb, taken on 05.04.1977 to the south of the town of Kavarna.

We know that *B. sarmatica* was found for the first time in the vicinity of the town of Balchik in 1939 by the Romanian botanist J. PRODAN. After the inclusion of South Dobroudja in the territory of Bulgaria, the plant has not been found by Bulgarian botanists.

We also know that the German botanists KNAPP, MESSER and WICHLE reported *Bellevalia ciliata* NESS. for the flora of Dobroudja. However, we do not have their publication at our disposal.

Since Prof. KITANOV did not report *B. sarmatica*, we should therefore accept that in our report it is mentioned for the first time as a new species for the flora of Bulgaria. *B. sarmatica* is a Ponto-Sarmatic species whose area is Precaucasia, lower Volga, Don and Dnepr, as well as Crimea and Moldavia. The localities nearest to Bulgaria are Crimea and Moldavia.

Epipactis atrorubens (HOFFM.) SCHULT. - Middle Balkan Mountains. On grassy places on Koziata stena - the northern slope. Plants with flowers were collected on 16.08.1995.

The species is new for the Balkan mountains. According to STOYANOV (1964, p. 389) and STOYANOV, STEFANOV & KITANOV (1966, p. 266) it is known only from "Pirin, Slavyanka and Middle Rhodope".

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Received: 2 December 1997
Revised: 23 October 1998
Accepted: 26 October 1998