

**FRITILLARIA MONTANA HOPPE (LILIACEAE JUSS.)  
IN UKRAINE: DISTRIBUTION, HABITATS AND SOME  
TAXONOMIC NOTES**

MARIIA KAZEMIRSKA  
ALEXANDER KAGALO

KAZEMIRSKA M., KAGALO A. *Fritillaria montana* Hoppe (*Liliaceae* Juss.) in Ukraine: distribution, habitats and some taxonomic notes // Scientific principles of biodiversity conservation. – 2015. – Vol. 6(13), № 1. – P. 133-144. – ISSN 2220-3087.

Data on distribution, taxonomy and ecological preferences *Fritillaria montana* Hoppe (*Liliaceae* Juss.) in Ukraine are given in the article. The results of their field studies, the data presented in the literature and of some herbaria materials from Ukraine, Europe and Russia are analyzed. Established that *F. montana* is a species of taxonomic rank, the its area which covers the southern and south-eastern Europe. A study of morphological variability *F. montana* such signs taxonomic species established: stem abundant covered with leaves in the upper part, the lower leaves are opposite, leaves on top spirally twisted; flowers solitary or in groups of 3-5, with a distinct checkerboard pattern; seed boxes wingless, the capsule in *F. montana* is wingless, three-lobed obovate, top blunt, narrowed at the base into short peduncles. With the spread of *F. montana* belongs to the Balkan geoelement, mountain subelement. It is south Balkan-European species, common in south-eastern Europe. In Ukraine *F. montana* is noted in 14 localities, 11 of which exist today, and 3 – the species not found. The majority of the studied populations of the species confined to forest communities Class Quercu-Fagetea, except for one that grows in the composition of meadow community of class Molinio-Arrhenatheretea.

**Key words:** *Fritillaria montana* Hoppe, distribution, habitats, taxonomy

Genus *Fritillaria* L. (*Liliaceae*) includes about 140 species of perennial bulbous geophytes distributed in the Northern Hemisphere, from the North America to the Mediterranean region and temperate Asia (Bartolucci, Caparelli, Peruzzi, 2009; Peruzzi, Bartolucci, 2009). *Fritillaria* species are found in the Mediterranean and Irano-Turanian phytogeographical regions. The genus is represented worldwide by 165 taxa of which 40 have been recorded from Turkey, 25 from Greece, 24 from China, 20 from California, 18 from Iran (Rix, 2001).

In Europe the genus *Fritillaria* is represented by 24 species. Most of them are concentrated in the Mediterranean region, and they are characterized by limited ranges, confined to certain mountain systems in Europe, the Mediterranean Islands and Balkan regions. The largest ranges are specific to *F. meleagris*, *F. meleagroides* and *F. ruthenica*, which occupy very significant areas on the territory of Eurasia (Lozina-Lozinskaia, 1935; Bordzilovsky, 1950).

*F. montana* Hoppe ex W.D.J. Koch is worthy of special attention. In the IUCN list this species is in the category of Data defined (Nearly Threatened (NT) according

to the IUCN criteria for Red List categories (uncertain, but are close to the category of extincting, according to IUCN criteria)). In addition, *F. montana* is listed in the Annex of the Bern Convention (Vinichenko, 2006).

### Materials and methods

The present study of *F. montana* is based on field observations and plant material collected in most of the regions of Ukraine proper and Moldova. The herbarium specimens were determined and/or revised from the collections of the National Academy of Sciences of Russia V.L. Komarova Institute of Botany (*LE*), National Academy of Sciences of Ukraine M.G. Kholodny Institute of Botany (*KW*), Ivan Franko National University of Lviv (*LW*), State Museum of Natural History (Lviv) (*LWS*), Institute of Ecology of the Carpathians of National Academy of Sciences of Ukraine (*LWKS*), Institute of Botany of the Jagiellonian University in Krakow (*KRA*), Polish Academy of Sciences (*KRAM*), University of Vienna (*WU*), Naturhistorisches Museum Wien (*W*), The University of Bucharest (Universitatea din București) (*BUC*), Alexandru Ioan Cuza University of Iași (*I*, *IAGB*, *IASI*), Natural History Museum in Iasi, Kherson Museum of Natural History (*KHEM*), and Yuriy Fedkovych Chernivtsi National University (*CHER*) Herbariums. All relevant literature was also checked for additional information on the distribution patterns of *F. montana* species.

The distribution of *F. montana* in Ukraine is presented on UTM maps (20 × 20 km<sup>2</sup> grid).

### Results and discussions

The total area of *F. montana* covers the South-Eastern France, Austria (Tyrol), Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Bulgaria, Macedonian Republic, Albania, Greece, Hungary, Romania, Moldova and Ukraine (Zahariadi, 1966; Rix, 1980). Overall, it's a South-European-Balkan species with disjunctive range.

This species, *F. montana*, also is interesting, because there has been a long-standing confusion in botanical literature concerning the nomenclature of this taxon. For a long time European botanists often identified it with other types of taxa of the genus *Fritillaria*, such as *Fritillaria orientalis* Adams (Rix 1980) or *Fritillaria tenella* M. Bieb. (Kamari, 1991), *F. degeniana* H. Wagner (Wagner, 1906), *F. intermedia* N. Terracc., *F. liburnica* B. Lengyel, *F. pollinensis* N. Terracc. These species are widely distributed in the South-Eastern Europe, in particular from the South-Eastern France to Romania (Bartolucci, Caparelli, Peruzzi, 2009).

Classifications of the genus *Fritillaria* have been developed by different authors, which in a different manner interpreted the systematic structure of the genus. *F. montana* as an independent taxon was allocated in the various sections.

In this regard, we consider it is necessary to highlight the history of taxonomic research of *F. montana*.

In 1753 C. Linnaeus in his work “Species Plantarum” first described the genus *Fritillaria* with the selection of the distinctive morphological features, and also gave a description of the three species of the genus: *F. persica*, *F. pyreneica*, *F. meleagris* (Linnaeus, 1753).

In 1805 J.F. Adams in his work “Beitrag zur Naturkunde” in the section devoted to the study of plants of the Caucasus “Decades plantarum novarum specierum quinque et Caucasi Iberiae, quas in itinere comitis Mussin-Puschkin observavit et defini-tionibus D. descriptionibus atque illustravit Jo. Frid. Adam” first brought the description of *F. orientalis*. The author notes that this is a new species of the genus *Fritillaria* from the territory of the Caucasus (Adams, 1805).

After three years F.A. Bieberstein in the work “Flora Taurico-Caucasica” described from the Caucasus *F. tenella* and as a synonym suggested the name of *F. orientalis* Adams, referring to the collection of A.A. Musin-Pushkin, who, also with Adams journeyed to the Caucasus (Bieberstein, 1808).

*F. montana* was first described from Italy, in the vicinity of Trieste by David Heinrich Hoppe in “Flora XV” in 1832. David Hoppe in the description of *F. montana* noted the morphological characters that distinguish the recent from *F. tenella*, comparison with which was done based on the study of herbarium of A. A. Musin-Pushkin (Koch, Hoppe, 1832).

However, this species was not immediately recognized by European botanists.

In 1866 J.F. Schur in “Enumeratio plantarum Transsilvaniae” describes *F. tenella* from Transylvania. Among its synonyms he mentioned the following: *F. montana*, *F. pyrenaica* Host, *F. orientalis* Adam, *F. racemosa* a. *minor* Schult, *F. involucrate* Heuff. (Schur, 1866).

Eventually, other authors (Nyman, 1881; Boisser, 1882; Bentham, Hooker, 1883; Kerner, 1884 et al.) began to cite the name of *F. montana* as synonymous to the name *F. tenella* when describing this species from different areas of Europe.

An information about the distribution of *F. tenella*, which is considered as a synonym of *F. montana* and *F. orientalis* on the territory of Ukraine, in particular of former Kherson province, the North of Bessarabia, first appeared in the period between 1897-1935 years. At that time, Bessarabia was the County of the Russian Empire, the region between the Black sea and the Danube, Prut, Dniester rivers. Bessarabia was divided into the North and the South. The North included – Sokyriany, Kelmentsi and part of Khotyn (Khotyn upland) areas of modern Chernivtsi region and the territory of Moldova, while the South – covered the territory of modern Odessa region.

In 1897 I. Schmalhausen in the “Flora of Middle and southern Russia, Crimea and the North Caucasus” for the first time recalls about the distribution of *F. tenella* in Ukraine. The author indicates that the species is distributed in some regions of Ukraine, in particular in the South-Western part of Podolia (Algenol at Rashkova and Balt. in Ribnica) and Bessarabia (Bălți, Bendery). The information about the total area, which covers the Caucasus, Istria, Dalmatia, southern Hungary, Transylvania, Serbia, Dobrudja, Bulgaria was given. I. Schmalhausen combines the Caucasian

plants with the southern European (Schmalhausen, 1897).

In 1914 I.K. Paczoski in the work “Flora of Kherson” (“Khersonska flora”). Vol. 1. Higher cryptogams, gymnosperms, monocots” (1914) cited *F. tenella* as one of the most rare plant species occurring in the Kherson province (Paczoski, 1914).

In 1924 Tr. Săvulescu, T. Rays in “Materiale pentru Flora Basarabiei” provides details on the distribution of *F. tenella* in the North Bessarabia, particularly in the vicinity of Vertiujeni and Corpaci (territory of modern Moldova) and the authors identify a variety of var. *latifolia* Uechez., indicating its location in the surroundings of Vertiujeni in Soroca (Rev. Prof. Dr. A. Borza) – territory of modern Moldova (Săvulescu, Rayss, 1924; Borza, Lupşa, 1962).

The first mention of the distribution of *F. montana* on the territory of modern Chernivtsi region appears in the work of E. Țopa “Floristice Fragmente din Basarabia și Bucovina de Nord” in 1936 (Țopa, 1936). The author notes the presence of the species in the area of Sokyriany, Sokyriany district, Chernivtsi region (the vicinity of Rozkopyntsi (to the Sokyriany city), 29.04.1935, E. Țopa (CHER)).

The first attempt to differentiate *F. montana* and *F. orientalis* was done in the “Flora of the USSR”, including indications of differential characters between these two taxa (Lozina-Lozinskaja, 1935). The two species are geographically separated in the USSR, i.e.: *F. montana* grows in the European part (Central Dnieper region, i.e. Podolie), while *F. orientalis* is limited to the Caucasus, including the slopes of the mountain massif in Armenia and Georgia. Subsequently, more differential characters were added in the process (Zahariadi, 1966). Finally, Kamari (1991) differentiated *F. montana* from *F. orientalis*, considering that *F. montana* is distributed in S and SW Europe (including Greece), while *F. orientalis* is restricted to the Caucasus region.

It is important to note that the possible reason for the discussion of the species status of *F. montana* is that all three (four) taxa, *F. montana*, *F. orientalis*=*F. tenella* and *F. degeniana* have been described from the “adjacent places” of *F. montana* distribution. Thus, we should expect a great variation of morphological characteristics of these border populations of the species. Therefore, we have made a comparative table on the basis of the descriptions of these species made by the authors in their respective floras.

Table.

**Differential characters between *F. orientalis*, *F. montana* and *F. meleagroides* according to literature data**

The features	Species		
	<i>F. montana</i>	<i>F. orientalis</i>	<i>F. meleagroides</i>
<b>Leaves</b>			
<b>Location</b>	The leaves are mostly opposite; the top and bottom ones are almost always close in 2,	Always alternate placement of the leaves; the upper leaves collected in whorls of 3-4	Immediate, their numbers – 3-7, in the basis – twisted

	the upper sometimes in 3, intermediate – alternate, bract – whorl, between the stem and the bract on the stalk there is a leafless interval		
<b>Flowers</b>			
<b>Quantity</b>	Flowers 1-6 (and often 3 or 4 flowers in bunches), significantly smaller, pedicels almost erect	Flowers solitary, on bended pedicels	Flowers solitary, drooping at the apex, without longitudinal stripes on the petals of the perianth
<b>The perianth</b>			
<b>Color, shape</b>	Less campanulate perianth, elliptical lobe with a bluish spathe and less clear-cut checkerboard pattern	Widely campanulate, the petals are brownish – purple with a clear checkerboard pattern	Bell-shaped, dark brownish-purple with obscure checkerboard pattern or mottled, from the inside – more lighter
<b>Honey hole</b>	Honey hole at the base of perianth lobes is ovate-oblong	Honey hole at the base of the sepals is oblong-linear	Honey hole at the base of sepals linear
<b>Pistil, capsule</b>			
<b>Pistil</b>	Column pistil until almost the middle is tripartite; nectaries linear	Column pistil, cut into $\frac{1}{4}$ - $\frac{1}{2}$ of its length, nectaries ovate-lanceolate, located at 5-10 mm above the base of the petals	Column pistil to half or rarely up to one-third is tripartite, shorter than the ovary, equal or slightly longer, the nectaries in the form of grooves
<b>The shape and size of capsule</b>	Wingless, three-lobed, obovate, obtuse above, narrowed at the base into a short peduncles	blunt hex	Oblong-obovate, bluntly triangular, pointed
<b>Geographical characteristics</b>			
<b>The element of flora</b>	The Central-Southern European Submediterranean (Western Pontic) element of flora	The Eastern Pontic element locally distributed in the Caucasus	The Black sea – Kazakhstan flora element
<b>The number of chromosomes</b>			
<b>The number of chromosomes</b>	$2n = 18$	$2n = 24$	$2n = 24$
<b>Place in the system of the genus</b>			
<b>Ser.</b>	ser. <i>Alternifoliae</i>	ser. <i>Trichostylae</i>	ser. <i>Trichostylae</i>

**Distribution in Ukraine.** On the basis of generalization of literature data, herbarium data and inventory of field studies, we observed increase of *F. montana* area and found 14 localities on the territory of Ukraine, of which 11 were existing and three localities we were unable to confirm (in the vicinity of Isaieve and Biliivka cities, Odessa region and Cybulskiy forest, Khmelnytsk region). Most of sites were found within the Chernivtsi region (between Prut and Dniester rivers).

For seven years we have studied the species of *F. montana* on the territory of Ukraine (Kazemirska, 2011, 2013). The data concerning inventory of *F. montana* distribution in Ukraine is given below:

**Odessa region:**

- 1) the outskirts of Isaievo village on Tyligul (Tiligul, Ananievskiy district Hersonskaya province), (the modern Odessa region territory) (Paczoski, 1914);
- 2) near urban village Bilyaeka, on the Kuchurgan river's slope (Sobko, 1992).

**Khmelnytskiy region:**

**Kamyanets-Podilskiy district:**

- 3) Tsubulivskiy forest, outskirts of Kamyanets-Podilskiy city (M.M. Krutskevich, 1937); within NNP "Podilsky Tovtry";
- 4) the left bank of the Dniester river, near the Pedagogical institute cottages, behind the Ustia village, woody lowland, 24.04.1999, L.G. Lyubinska (*KW*), (Lyubinska, 2000); Kamyanets-Podilskiy district, near the Ustya village, downstream of the Dniester river from the village, oak forest behind the cottages, leg. 17.04.2001, A.A. Kagalo, det. 06.02.2002, N.V. Skibitska (*LWKS*);
- 5) the left bank of the Dniester river, outskirts Sokil village, forest Sokolivske forestry, quarter 22, 01.05.2012, I.I. Chorney, V.V. Budzhak, A.I. Tokaryuk, A.A. Kagalo, M.A. Kazemirska (*CHER*).

**Chernivtsi region.**

**Khotyn district:**

- 6) near the Krutenky village, Khotyn State Forestry, Novoselytske forestry, quarter 2, area 12, ash with linden forest, 17.07.2007, I.I. Chorney, V.V. Budzhak, A.I. Tokaryuk, O.D. Volutsa (*CHER*); 24.04.2010, M.A. Kazemirska, (*CHER*).
- 7) outskirts of the Kaplivka village, Khotyn State Forestry, Novoselytske forestry, quarter 39, area 6, cherry-oak forest, 18.04.2008, I.I. Chorney, V.V. Budzhak, A.I. Tokaryuk, O.D. Volutsa (*CHER*); 20.04.2010, M.A. Kazemirska, (*CHER*).

**Kelmentsi district:**

- 8) outskirts of the Zelena village, 15.06.1930, U. Jireada; outskirts of the Zelena village, Kelmentsi forestry, quarter 48, area 16, forest plantation, 25.04.2008, I.I. Chorney, V.V. Budzhak, A.I. Tokaryuk, O.D. Volutsa (*CHER*); 17.04.2010, M.A. Kazemirska, (*CHER*);
- 9) outskirts of the Mikhailovka village, Khotyn State Forestry, Novoselytske forestry, quarter 1, area 10, maple and ash forest (24.04.1998, I.I. Chorney, V.V. Budzhak (*CHER*; *KW*); 18.04.2008, I.I. Chorney, V.V. Budzhak, A.I. Tokaryuk, O.D. Volutsa (*CHER*); 27.04.2010, M.A. Kazemirska, A.I. Tokaryuk, (*CHER*);

- 10) outskirts of the Podviriyivka village, the Bortosh tract, meadow and steppe slopes, 25.04.2006, Volutsa (*CHER*); outskirts of the Podviriyivka village, the Bortosh tract, reduced humidified area on the meadow and steppe slopes, 25.04.2008, I.I. Chorney, V.V. Budzhak, A.I. Tokaryuk, O.D. Volutsa (*CHER*); 17.04.2010, M.A. Kazemirska (*CHER*);
  - 11) outskirts of the Lenkivtsi village, Kelmenetsky district (Svyrydyuk, Shcherbakova, 2010); outskirts of the Lenkivtsi village, Kelmenetsky district, 20.04.2011, I.I. Chorney, V.V. Budzhak, A.I. Tokaryuk, M.A. Kazemirska (*CHER*).
- Sokyryany district:
- 12) outskirts of the Shebutyntsi village, Shebutynskiyi ravine site, 08.05.1999, I.I. Chorney, V.V. Budzhak (*CHER*); 23.04.2010, oak and hornbeam forest, V.V. Budzhak, A.I. Tokaryuk, M.A. Kazemirska (*CHER*);
  - 13) outskirts of the Mikhalkovo village, oak and hornbeam forest on the north-western slopes at 15-20 ° to the district of the Dnister river, 18.04.2010, M.A. Kazemirska, A.I. Tokaryuk (*CHER*) (Kazemirska, Chorney, 2010);
  - 14) outskirts of the Rozkopyntsi village (to the Sokyriany city), 29.04.1935, E. Topa (*CHER*); Khotyn State Forestry, Sokyryany forestry, quarter 24, area 30, site "Izvor", on the slopes of the Sokyriany river, maple, oak and hornbeam forest, 23.04.2004, O.D. Volutsa, A.I. Tokaryuk (*CHER*); 25.04.2010, oak and hornbeam forest, M.A. Kazemirska, A.I. Tokaryuk (*CHER*).

**Habitats and ecology.** The vast majority of populations of *F. montana*, which have been investigated are classified as isolated, which were formed as a result of the gap once-relatively continuous range and now separated by geographic, environmental or mechanical insulation barriers. That is, it is fragmented, isolated populations confined to localities remaining species as habitats, because the place where *F. montana* grows, are secondary, partially or completely synanthropic.

Within its range it grows in forests and bushes, on edges and meadows. Its habitats are located in the altitude range from 80 to 1800 m a. s. l. (Chorney, Kagalo, Lyubinskaya, 2009). Species is represented in regions with a Submediterranean climate, demanding to heat, moisture and light. It grows on different soil types – sand, silica, limestone and serpentinicola, ophiolite soils in the rocky ground. It is characterized by wide amplitude range of light habitats from open Sunny areas, shrubs, bright and partially shaded forests.

*F. montana* – Balkan geoelement, mountain subelement. *F. montana* is ephemeroïd, polycarpic geophyte. In Ukraine *F. montana* belongs to the ecological group of mesophytes, heliostsiophytes, mesotermophytes, marhinants, stenophytes. The populations of *F. montana* grow in forests and meadows. Most of populations belong to the class *Quercus-Fagetea*, also there are populations of this species, which are included to the meadow communities of the class *Molinio-Arrhenatheretea*.

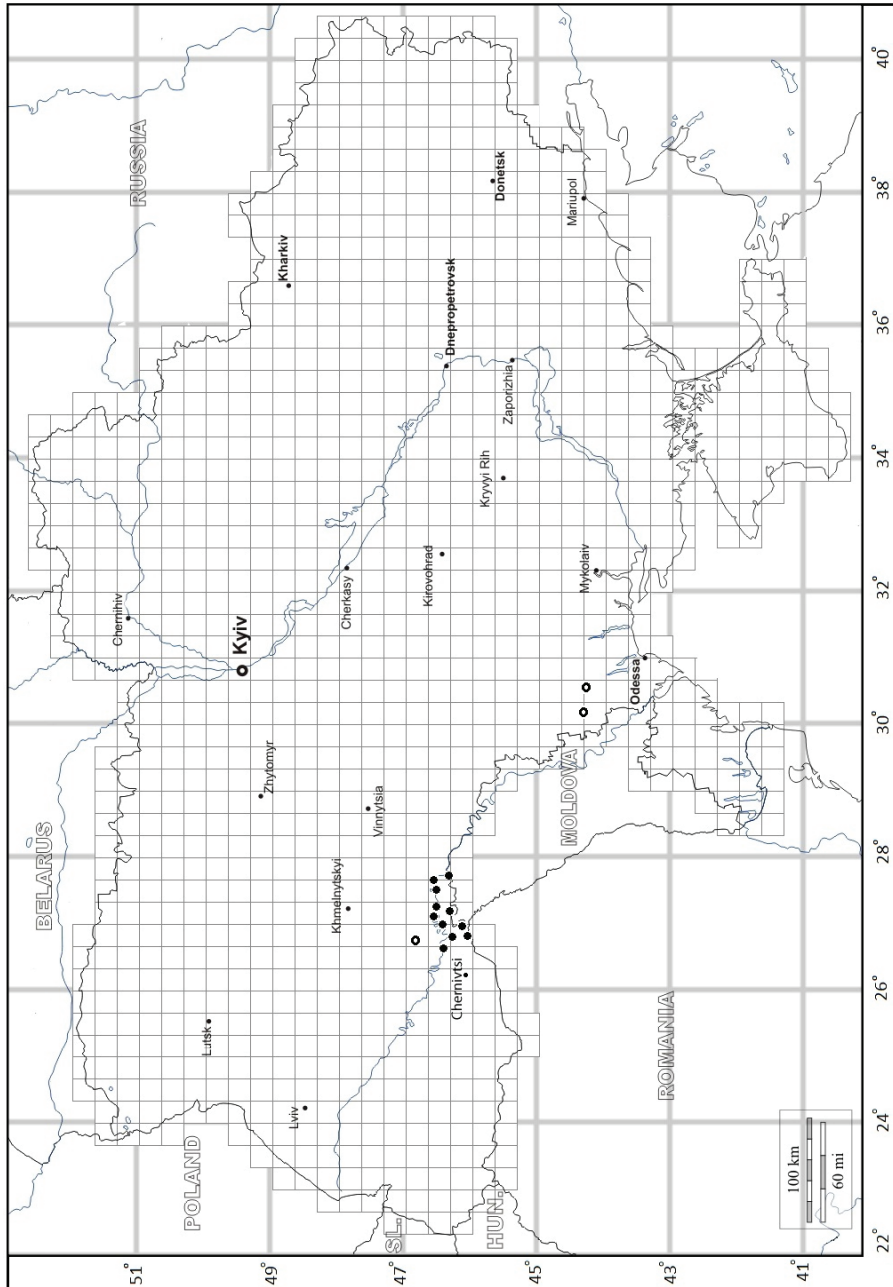


Fig. The distribution of *Fritillaria montana* Hoppe in Ukraine. Indication of localities: black circle-white center – lost location of *F. montana*; black circle-black center – available location of *F. montana*.



## Conclusions

1. Thus, *F. montana* is a separate taxon of species rank, which area covers the southern and the South-Western Europe. The Italians L. Peruzzi and F. Bartolucci after studying the selected lectotype and live plants with Monte Spaccato bei Trieste (April, 2007) concluded that the typical material clearly represents the South-East European species, for which the name of *F. montana* is used now. According to this, *F. montana* actually is the oldest valid (valid, suitable) name for this species.

Other names, such as *F. tenella* and *F. orientalis* were used incorrectly, as noted by G. Kamari (Kamari, 1991) and G. Tomović (Tomović et al., 2007), European botanists and actually relate to other species.

2. According to the results of studying the variability of individuals of *F. montana* on morphological level it was found that taxonomical significant signs of *F. montana* are follows:

- *F. montana* has stem with many leaves in the upper half and the lower leaves are usually opposite, bract – whorl of 2-4, between stem and bract leaves on the stem there is a leafless interval;
- upper leaves of *F. montana* at the top are spirally twisted, the upper and lower leaves are usually closely spaced in 2 or 3;
- *F. montana* flowers are solitary or in clusters (3-5), considerably smaller with less distinct checkerboard pattern;
- the capsule in *F. montana* is wingless, three-lobed obovate, top blunt, narrowed at the base into short peduncles;

3. According to the distribution, *F. montana* belongs to the Balkan geoelement, mountain subelement. This is the South-Balkan-European species, distributed in the South-Eastern Europe. In Ukraine *F. montana* was noted in 14 localities, 11 of which are available today, and in three localities it could not be found.

4. Almost all investigated populations are confined to forest communities of the class *Quercus-Fagetea*, except one (in the vicinity of Podviriyivka village), which belongs to the class of meadow communities *Molinio-Arrhenatheretea*.

---

ADAMS J.F. Decades quinque novarum specierum plantarum Caucasi et Iberiae // Weber F., Mohr D.M.H. Beitrage zur Naturkunde. Kiel, 1805. – Bd 1. – S. 50.

BARTOLUCCI F., CAPARELLI K.F., PERUZZI L. A biometric study of *Fritillaria montana* Hoppe ex W.D.J. Koch s. l. (*Liliaceae*) shows a single polymorphic species, with no infraspecific taxa // Plant biosystems. – 2009. – Vol. 143, № 3. – P. 516-527.

BENTHAM G., HOOKER J.D. *Fritillaria* // Genera Plantarum. – 1883. – Vol. 3. – P. 817-818.

BIEBERSTEIN F.A. Flora Taurico-Caucasica. – Charkoviae: 1808. – Vol. 1. – P. 269, 425.

BOISSER P.E. Flora Orientalis. – 1882. – Vol. 5. – P. 176-190.

BORDZILOVSKYI YE.I. Rodyna *Liliaceae* Hall. // Flora URSS. – K.: Vyd-vo AN URSS, 1950. – T. 3. – S. 61-266. (in Ukrainian).

BORZA A., LUPȘA V. Date taxonomice cu privire la cunoașterea speciei *Fritillaria orientalis*

- Adam // Studii și cercetări de biologie (Chuj). – 1962. – Т. XIII. – P. 217-220.
- CHORNEY I.I., KAGALO A.A., LYUBINSKAYA L.G. *Fritillaria montana* Hoppe // Red Data Book of Ukraine. Plant Kingdom / [ed. by Ya.P. Didukh]. – K.: Globalconsulting, 2009. – P. 139.
- KAMARI G. *Fritillaria* L. // Mountain flora of Greece. – Edinburgh Univ. Press, 1991. – Vol. 2. – P. 672-683.
- KAZEMIRSKA M.A. Short review of history of the research *Fritillaria montana* Hoppe in Ukraine // V International conference of young scientists “Biodiversity. Ecology. Adaptation. Evolution.”, dedicated to 160th anniversary from the birth of professor Frants Kamenskiy. – Odessa, June 13-17, 2011. – P. 26-27.
- KAZEMIRSKA M.A. *Fritillaria montana* Hoppe (*Liliaceae* Juss.) in Ukraine (chorology, structure of populations, conservation). – Manuscript. Ph. D. of Biological Sciences Degree Thesis; speciality 03.00.05 – botany. – M.M. Gryshko National Botanical Garden of the National Academy of Sciences of Ukraine, Kyiv, 2013. – 20 p.
- KAZEMIRSKA M., CHORNEY I. *Fritillaria montana* Hoppe in synanthropic forest communities in the area between the Prut and Dniester rivers (Chernivtsi region) // IX International Conference Anthropization and Environment of Rural Settlements. Flora and Vegetation. – Kamyanets-Podilskiy and Boyany, Ukraine, 29 June-01 July 2010. – Kyiv: M.G. Kholodny Institute of Botany, NAS of Ukraine, 2010. – P. 32-33.
- KERNER A. Schedae ad Floram Exsiccata Austro-Hungaricam opus cura musei botanica universsitatit vindobonensis conditum. – Vindobonae, E. Typographia caesarea regia aulica et imperiali, 1884. – P. 137.
- KOCH W.D.J., HOPPE D. II Correspondenz. Auszug aus einem Schreiben des Hrn. Hofrath Dr. Koch in Erlangen und Prof. Hoppe über *Fritillaria montana* Hoppe // Flora 15 – 1832. – № 2. – P. 476-480.
- KRUTSKEVYCH M.M. The Additions to the flora of Kameneckiy // Phys. Institute of Botany, Academy of Sciences of the Ukrainian SSR. – 1937. – Vol. 11, № 19. – P. 137.
- LINNAEUS C. Species Plantarum. – Soulsby, Stockholm, 1753. – T. 1. – P. 30-304.
- LOZINA-LOZINSKAJA A.S. Rabčik – *Fritillaria* L. – In: Komarov, V.L. (ed.) // Flora URSS – Acad. Sci. USSR, Leningrad (in Russian), 1935. – Vol. 4. – P. 302-320.
- LYUBINSKA L.G. *Frytillaria montana* Hoppe (*Liliaceae*) in NNP “Podilski Tovtry” // Ukr. Botan. Journ. – 2000. – № 3. – P. 284-286.
- NYMAN C.F. Conspectus Florae Europaeae. – 1881. – P. 721-722.
- PACZOSKI J.K. Khersonskaya flora. Vol. 1. The higher cryptogams, gymnosperms, monocots. – Kherson, 1914. – S. 445-446.
- PERUZZI L., BARTOLUCCI F. Typification of the names within *Fritillaria montana* complex (*Liliaceae*) from central Mediterranean area // Candollea. – 2009.– Vol. 64, № 1. – P. 133-142.
- RIX E.M. *Fritillaria* L. // Flora Europaea. – Cambridge Univ. Press, 1980. – Vol. 5.– P. 31-34.
- RIX E.M. *Fritillaria*. A Revised classification. The *Fritillaria* Group of the Alpine Garden Society. – United Kingdom, 2001.
- SĂVULESCU TR., RAYSS T. Materiale pentru Flora Basarabiei. – Bucuresti, institutul de arte Grafice Bucovina, 1924. – P. 66.
- SCHMALHAUSEN I. Flora of Middle and Southern Russia, Crimea and Northern Caucasus. – K.: 1897. – Vol. 2. – P. 507-508.
- SCHUR J.F. Enumeratio plantarum Transsilvaniae. – Vindobonae, 1866. – P. 661-662.
- SOBKO V.G. New species and new localities of rare plants in the flora of Ukraine // IX

Congress of the Ukrainian Botanical society: abstracts of reports. – K.: Naukova Dumka, 1992. – P. 44.

ТОМОВИЋ G., ВУКОЛЈИЋ S., НИКЕТИЋ M. ET AL. *Fritillaria* (*Liliaceae*) in Serbia: distribution, habitats and some taxonomic notes // *Phytologia Balcanica*. – Sofia, 2007. – № 13 (3). – P. 59-370.

ЂОРА E. Fragmente floristiche din Bucovina și Basarabia de Nord // *Bul. Grădinii Botanice și al Muzeului Botanic de la Univ. din Cluj*. – 1936. – № 15. – P. 209-218.

VINICHENKO T.S. Plants of Ukraine protected by the Bern Convention // K.: Ministry of environmental protection of Ukraine, 2006. – P. 27-28.

WAGNER J. *Fritillaria degeniana* nov. sp. // *Magyar Bot. Lapok*, 1906. – № 5 (7). – P. 189-195.

ЗАХАРИАДИ C. Fam. *Liliaceae*, *Amyrillidaceae* // *Flora Republicii Socialiste România*. – Editura Academiei Republicii Socialiste România, 1966. – Vol. XI. – P. 291-295.

### **FRITILLARIA MONTANA HOPPE (LILIACEAE JUSS.) В УКРАЇНІ: ПОШИРЕННЯ, ОСЕЛИЩА ТА ДЕЯКІ ТАКСОНОМІЧНІ ОСОБЛИВОСТІ**

М.А. КАЗЕМИРСЬКА, О.О. КАГАЛО

У статті наведено дані щодо поширення, таксономії й екологічних переваг *Fritillaria montana* Hoppe (*Liliaceae* Juss.) в Україні. Проаналізовані результати власних польових досліджень, дані, наведені в літературі й матеріали низки гербаріїв України, Європи й Росії. Встановлено, що *F. montana* – це таксон видового рангу, ареал якого охоплює південну й південно-східну частину Європи. У результаті вивчення морфологічної мінливості *F. montana* встановлені такі таксономічні ознаки виду: стебло рясно облиствене у верхній частини, нижні листки супротивні, листки на верхівці спіральньо скручені; квітки поодинокі або групами по 3-5, з чітко вираженим шахматним візерунком; насінні коробочки безкрилі, трилопатевообернено яйцевидні зверху тупі, знизу звужуються у коротку ніжку. За поширенням *F. montana* належить до балканського геоеlementу, гірського піделементу. Це південно-балкансько-європейський вид, поширений у південно-східній Європі. В Україні *F. montana* відзначена в 14 локалітетах, 11 з яких існують на сьогодні, а в 3 – вид не знайдений. Переважна більшість досліджених популяцій виду приурочена до лісових угруповань класу *Quercus-Fagetum*, за виключенням однієї, яка росте у складі лучних угруповань класу *Molinio-Arrhenatheretea*.

**Ключові слова:** *Fritillaria montana* Норпе, поширення, оселища, таксономія

### **FRITILLARIA MONTANA HOPPE (LILIACEAE JUSS.) В УКРАИНЕ: РАСПРОСТРАНЕНИЕ, МЕСТООБИТАНИЯ И НЕКОТОРЫЕ ТАКСОНОМИЧЕСКИЕ ОСОБЕННОСТИ**

М.А. КАЗЕМИРСКАЯ, А.А. КАГАЛО

В статье приведены данные о распространении, таксономии и экологических предпочтениях *Fritillaria montana* Норпе (*Liliaceae* Juss.) в Украине. Проанализированы результаты оригинальных полевых исследований, литературные данные и материалы ряда гербариев Украины, Европы и России. Показано, что *F. montana* – это таксон видового ранга, ареал которого охватывает южную и юго-восточную части Европы. В результате изучения морфологической изменчивости *F. montana* определены такие таксономические признаки вида: стебель густо облиствен в верхней части, нижние листья супротивные, листья на верхушке спирально закрученные; цветки единичные или по 3-5, с четко выраженным шахматным рисунком; семенные коробочки бескрылые, трилопастнообратнояйцевидные, на вершине тупые, снизу сужаются в короткую ножку. По

особенностям распространения *F. montana* принадлежит к балканському геоелементу, монтанному поделементу. Это южно-балканско-европейский вид, распространенный в юго-восточной Европе. В Украине *F. montana* известна из 14 локалитетов, 11 из которых существуют ныне, а в 3 – вид не найден. Большинство изученных популяций вида приурочена к лесным сообществам класса *Quercus-Fagetea*, за исключением одной, которая кастет в составе луговых сообществ класса *Molinio-Arrhenatheretea*.

**Ключевые слова:** *Fritillaria montana* Норре, распространение, местообитания, таксономия

Надійшла 03.11.2015

Прийнята до друку 24.12.2015

КАЗЕМІРСЬКА М.А. Національний медичний університет імені О.О. Богомольця, проспект Перемоги, 34, м. Київ, 03955, Україна; e-mail: mkazemirska@gmail.com

KAZEMIRSKA M.A. Bogomolets National Medical University, Peremogy avenue, 34, Kiev, Ukraine, 03955; e-mail: mkazemirska@gmail.com

КАГАЛО О.О. Інститут екології Карпат НАН України, вул. Козельницька, 4, м. Львів, 79026, Україна; e-mail: kagalo@mail.lviv.ua

KAGALO A.A. Institute of Ecology of the Carpathians NAS of Ukraine, 4, Kozelnytska St, Lviv, 79026, Ukraine; e-mail: kagalo@mail.lviv.ua