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Checklist of the genus *Jurinea* (Asteraceae: *Cardueae*) in Bulgaria

S.T. Bancheva^{1*}, A.N. Tashev²

¹Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, Sofia, Bulgaria

²Department of Dendrology, University of Forestry, Sofia, Bulgaria

*Author for correspondence: sbancheva@yahoo.com

Abstract. A targeted study on the taxonomic diversity of the genus *Jurinea* Cass. (Asteraceae) in Bulgaria was conducted. The genus *Jurinea* is quite difficult taxonomically and therefore the data from the literature regarding the number of taxa on the country territory are contradictory so far and range from 7 to 13. As a result of the present study based on examination of the collections of four Herbaria, field observations, and literature data, it was found that the genus is represented in Bulgaria by 11 species. Chorological information (general distribution and distribution within Bulgaria) is presented for each species. The species of conservation importance on the Bulgaria territory are also commented.

Key words: Bulgarian flora, distribution, endemic species, *Jurinea*.

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Jurinea Cass. (Asteraceae) is an interesting and taxonomically intricate genus belonging to a tribe *Cardueae* Cass. Its representatives are perennial herbaceous plants with adaptations to xero- and chasmophytic habitats. About 180 species are distributed in Eurasia, with major centres of diversity in Central and Southwest Asia, followed by the Eastern Mediterranean (Susanna et al., 2006; Szukala et al., 2019). The results of the phylogenetic study of L. Barres et al. (2013) show that the tribe *Cardueae* most likely originated in Middle Asia in the Oligocene – Miocene. According to W. Greuter (2006+), approximately $\frac{1}{3}$ of the recent taxa are distributed in Europe and Mediterranean region (defined as Euro+Med region). About 20 species occur in the Balkans. In Bulgaria, this group has not yet been sufficiently studied.

The present study aims to draw a contemporary Checklist of the genus *Jurinea* in Bulgaria, taking into account the new knowledge about the taxonomic treatment of the genus based on the literature data, as well as our research.

This investigation is the part of a more extensive study of the tribe *Cardueae*, in connection with the preparation of the last, 12th volume, of the multi-volume edition “Flora of the Republic of Bulgaria”.

Material and methods

The study conducted in 2016–2019 is based on data from three Bulgarian Herbaria (SO, SOA, SOM) and the Herbarium of the National Museum of Natural History in Paris (P), as well as from own field research. The Herbaria are cited by their official acronyms, as given in “Index Herbariorum” (<http://sweetgum.nybg.org/science/ih/>). In the dividing of the genus to the sections, we followed the taxonomic scheme proposed in the recent work by A. Szukala et al. (2019). Concerning the abbreviating of the plant author names, the present study follows the standard by R. Brummitt and C. Powell (1992) and “IPNI. International Plant Name Index” (www.ipni.org). The abbreviations for the general distribution follow the ones adopted W. Greuter (2006+), and those for the distribution in Bulgarian territory divided into 20 floristic regions, adopted in the edition “Flora of the Republic of Bulgaria” (Jordanov, 1963–1979).

Results

The available information on the taxonomic diversity of the genus *Jurinea* in Bulgaria is contradictory and varies from 7 to 13 taxa. N. Stoyanov and B. Kitanov (1967) give 9 taxa, S. Kožuharov (1976) – 11, S. Kožuharov (1992) – 10, D. Delipavlov and I. Češmedžiev (2003) – 7, W. Greuter and E. Raab-Straube (2008) – 13, W. Greuter (2006+) – 11, B. Assyov and A. Petrova (2012) – 8. The differences in the number of species are due to both the absence of targeted studies of the genus in Bulgaria and a different taxonomic treatment.

As a result, it was found that 11 species of the genus *Jurinea* divided into 3 sections occur on the territory of Bulgaria.

Sect. *Platycephalae* Benth.

1. *Jurinea arachnoidea* Bunge, 1841, Flora 24(1): 157. – *Jurinea consanguinea* DC. subsp. *arachnoidea* (Bunge) Kožuharov.

General distribution: Ab(A) –Ar Bu By –Gg Rf(C CS E S) Rm –Uk(K) Uk(U).

Distribution in Bulgaria: Black Sea Coast, Northeast Bulgaria, Balkan Range (Central), Sofia Region, Znepole Region, Mt Vitosha Region, Mt Sredna Gora, Rhodopi Mts (Central, Westwrn), Tundzha Hilly Country. Grows on dry grassy and stony places.

2. *Jurinea bulgarica* Velen., 1889, Sitzungsber. Königl. Böhm. Ges. Wiss. 1888: 51. – *Jurinea consanguinea* DC. subsp. *bulgarica* (Velen.) Kožuharov.

General distribution: Bu.

Distribution in Bulgaria: Northeast Bulgaria, Balkan Range (Eastern), Forebalkan (Eastern), Znepole Region, Rhodopi Mts (Central). Grows on dry grassy and stony places, calcicole. Bulgarian endemic.

3. *Jurinea consanguinea* DC., 1838, Prodr. [A.P. de Candolle], 6: 676.

General distribution: AE(G) Ar Bu Gr Ju Tu(A E).

Distribution in Bulgaria: throughout the country. Grows on dry grassy and stony places.

4. *Jurinea glycacantha* DC., 1838, Prodr. [A.P. de Candolle], 6: 677. – *Jurinea mollis* subsp. *glycacantha* (Sm.) Gajić.

General distribution: Al Bu Gr Hu Rm Sk Sr Tu(E).

Distribution in Bulgaria: Forebalkan, Balkan Range (Central). Grows on dry grassy and stony places.

5. *Jurinea ledebourii* Bunge, 1841, Flora, 24(1): 157.

General distribution: Bu Rf(C E) Rm Uk(K U).

Distribution in Bulgaria: Northeast Bulgaria, Danubian Plain. Grows on dry steppes.

6. *Jurinea mamillarioides* Iljin, 1963, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR, 22: 262. – *Jurinea mollis* (L.) Rchb. subsp. *anatolica* (Boiss.) Stoj. et Stef.

General distribution: Bu.

Distribution in Bulgaria: Mt Slavyanka, Pirin Mts, Belas, Rhodopi Mts (Eastern). Grows on dry grassy and stony places. Bulgarian endemic.

7. *Jurinea mollis* (L.) Rchb., 1831–1832. Fl. Germ. Excurs., 1(3): 290.

General distribution: Ab(A) AE(G) Al -Ar Au(A) BH Bu By Cg Cs Ct - Gg Gr Hu It Mk Mo Rf(C E S) -Rf(CS) Rm Sk Sl Sr Tu(A E) Uk(K U).

Distribution in Bulgaria: Balkan Range (Eastern). Grows on dry grassy and stony places.

8. *Jurinea neicevii* (Kožuharov) Greuter, 2003, Willdenowia, 33(1): 58. – *Jurinea consanguinea* DC. subsp. *neicevii* Kožuharov.

General distribution: Bu.

Distribution in Bulgaria: Balkan Range (Central, Western), Rhodopi Mts (Central, Western). Grows on stony places. Bulgarian endemic.

Sect. *Cyanoides* (Korsh. et Sosn.) Iljin

9. *Jurinea kilaea* Azn., 1897, Bull. Soc. Bot. France, 44: 172. – *Jurinea albicaulis* Bunge subsp. *kilaea* (Azn.) Kožuharov., *Jurinea kitanovii* Iljin.

General distribution: Bu Gr Tu(A E).

Distribution in Bulgaria: Black Sea Coast (Southern), Tundzha Hilly Country. Grows on sandy ground.

Sect. *Corymbosae* Benth.

10. *Jurinea stoechadifolia* (M. Bieb.) DC., 1838, Prodr. [A.P. de Candolle], 6: 674.

General distribution: Bu Mo Rf(C CS S) Rm Tu(A) Uk(K U).

Distribution in Bulgaria: Northeast Bulgaria. Grows on dry grassy and stony places, calcicole.

11. *Jurinea tzar-ferdinandi* Davidov, 1909, Sborn. Nar. Umotvorenija, 25: 28.

General distribution: Bu Rm. Distribution in Bulgaria: Northeast Bulgaria, Balkan Range (Eastern), Znepole Region, West Frontier Mts. Grows on calcareous slopes. Balkan endemic.

According to S. Kožuharov (1976) and W. Greuter (2006+), there is one more *Jurinea* species, *J. taygetea* Halácsy in Bulgaria. Our field research and consultation with the herbarium collections from the Bulgarian Herbaria (SO, SOA and SOM) show that this species is incorrectly indicated for the Bulgarian flora. The cited taxon is endemic to Greece.

Some of the studied taxa are widespread, like *J. consanguinea*, *J. arachnoidea*, *J. mollis*, while others have a rather restricted area. It is worth noting that three of the species are endemic to Bulgaria (*J. bulgarica*, *J. mamillarioides*, *J. neicevii*) and one more – to the Balkans (*J. tzar-ferdinandi*), resulting in an endemism ratio is about 36 %. Besides, two of the species are protected by the Biological Diversity Act (2002, 2007), these are *J. tzar-ferdinandi*, which is assessed as vulnerable [VU B1ab (iii) + 2ab (iii)] according to the IUCN criteria (1997), and *J. ledebourii*, which is endangered [EN A1c; B1ab (iii, iv) + 2ab (iv)]. These data testify to the special place occupied by the representatives of the genus *Jurinea* as part of the Bulgarian floristic diversity and require the efforts of the State and society for their effective conservation.

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Чек-лист рода *Jurinea* (Asteraceae: *Cardueae*) в Болгарии

С.Т. Банчева^{1*}, А.Н. Ташев²

¹Институт исследований биоразнообразия и экосистем Болгарской академии наук,
 София, Болгария

²Кафедра дендрологии, Лесотехнический университет, София, Болгария

*Автор для переписки: sbancheva@yahoo.com

Аннотация. Проведено исследование таксономического разнообразия рода *Jurinea* Cass. (Сложноцветные) в Болгарии. Род *Jurinea* довольно сложен таксономически, поэтому литературные данные о числе таксонов на территории страны противоречивы – приводимое число видов колеблется от 7 до 13. В результате

настоящего исследования, основанного на изучении коллекций четырёх болгарских Гербариев и полевых исследованиях, с учётом литературных данных, установлено, что в Болгарии род представлен 11 видами. Для каждого вида приведена хорологическая информация (общее распространение и распространение в Болгарии), отмечены виды, требующие охраны на территории страны.

Ключевые слова: флора Болгарии, распространение, эндемичные виды, *Jurinea*.

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