Critical reassessment of the distribution of some taxa of *Rumex* subg. *Rumex* (*Polygonaceae*) in Bulgaria

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Received: November 15, 2006 ▷ Accepted: April 04, 2007

Abstract. The chorology of *Rumex hydrolapathum*, *R. dentatus*, *R. palustris*, *R. confertus*, *R. cristatus*, *R. alpinus*, *R. conglomeratus*, *R. sanguineus*, and *R. stenophyllus* has been reassessed and updated. The collections in the Bulgarian herbaria have been revised. *Rumex palustris*, *R. confertus*, *R. cristatus*, *R. conglomeratus*, *R. sanguineus*, and *R. stenophyllus* have been reported from new floristic regions in the country. The participation of *R. dentatus* in the Bulgarian flora has not been confirmed. The chorological studies confirm *R. confertus* for the Bulgarian flora. The established localities of the studied species are presented on UTM-grid maps.

Key words: Bulgaria, chorology, ecology, *Rumex* subg. *Rumex*, UTM-grid maps

Introduction

The existing information about chorology and taxonomic structure of *Rumex* L. subg. *Rumex* in the Bulgarian flora is outdated and incomplete. The number of taxa in this group in the country has increased in time (Table 1). It is a result both of the change in the taxonomic concept and the discovery of new species in the Bulgarian flora, some of them being discovered in the last few decades, e.g. *R. cristatus* DC. (Panov 1987) and *R. maritimus* L. (Dimitrov 1997).

According to the latest taxonomic literature (Delipavlov 2003), *Rumex* subgenus *Rumex* in Bulgaria comprises 16 species and 11 subspecies.

The present paper is based on literature data, herbarium collections and recent field studies and aims at updating and summarizing the existing information about some of the Bulgarian representatives of *Rumex* subgenus *Rumex*.

Table 1. Genus *Rumex* subgenus *Rumex* in the Bulgarian Floras and Guides.

Major literature sources on the Bulgarian flora	Sections	Subgenera	Species	Subspecies	Varieties
Flora Bulgarica (Velenovský 1891)	–	–	8	–	–
Flora Bulgarica (Velenovský 1898)	–	–	6	–	–
Flora of Bulgaria (Stojanov & Stefanov 1924)	2	–	10	–	–
Flora of Bulgaria (Stojanov & Stefanov 1933)	–	–	11	–	–
Flora of Bulgaria (Stojanov & Stefanov 1948)	–	–	12	5	2
Flora of Bulgaria (Stojanov & al. 1966)	–	–	12	3	6
Flora RP Bulgaricae (Vulev 1966)	–	–	13	10	2
Guide to the vascular plants in Bulgaria (Andreev 1992)	–	–	14	11	2
Key to the plants in Bulgaria (Delipavlov 2003)	–	–	16	11	–

Material and methods

The plant material has been collected by the authors in the period 2002–2005. The collections are based on the transection method. Priority has been given to the least botanized regions. The available literature sources have been analyzed.

The collections in SOM, SO, and SOA have been revised. For some critical taxa with no or few existing herbarium specimens in the national herbaria, vouchers from the herbaria of Vienna University (WU) and Vienna Natural History Museum (W) have been used for comparison.

The chorological information for each species has been mapped with the "dSOA" software (Stoyanov 2003). The maps show floristic regions and subregions as accepted in the multivolume edition of *Flora RP Bulgaricae,* and the localities are mapped according to Kozhuharov & al. (1983).

Results and discussion

***Rumex hydrolapathum* Huds.** (Fig. 1)

Literature data show that the species is distributed in wet places along the Black Sea Coast (*Northern*), NE Bulgaria, Danubian Plain, Sofia Region, and Mt Strandzha (Table 2). The specimens in the Bulgarian herbaria are from five localities from the Black Sea Coast (*Northern*), NE Bulgaria and the Danubian Plain. The distribution in Mt Strandzha and Sofia Region is based on misidentified specimens from *R. crispus* L. and during our field studies within three vegetative seasons the species has not been found in these two floristic regions.

Black Sea Coast (*Northern*): wet places along Kamchia river, near its estuary, Varna district, at sea level, NH-76, 26.08.1923, coll. *D. Jordanov* (SO 17543); 17.09.1971, coll. *I. Penev* & *N. Vihodcevski* (SO 35773); 14.08.1996, coll. *D. Stoyanov* (SO 98411).

NE Bulgaria: marshy places near Razdelna, Varna district, 50 m, NH-57, 19.08.1929, coll. *D. Jordanov* (SO 17540, 1754); marshy places near Popina and Garvan villages, Silistra district, 20 m, MJ-98, 24.08.1946, coll. *D. Jordanov* (SO 17542);

Danubian Plain: Beska isle, near Svishtov, 50 m, LJ-63, 18.09.1922, coll. *B. Stefanov* (SOM 17780); Beska isle, near Svishtov, 50 m, NJ-28, 17.06.1929, coll. *N. Stoyanov* (SOA 3033, 3034).

Our studies have confirmed the species for the Danubian Plain: marshy places between Orsoya and Slivata villages, 34 m, PF-64, 14.08.2006, with flowers, coll. *Tz. Raycheva* (SOA 57088).

***Rumex dentatus* L.**

The species is reported only for the Danubian Plain and Sofia Region (Table 2). Its distribution in the

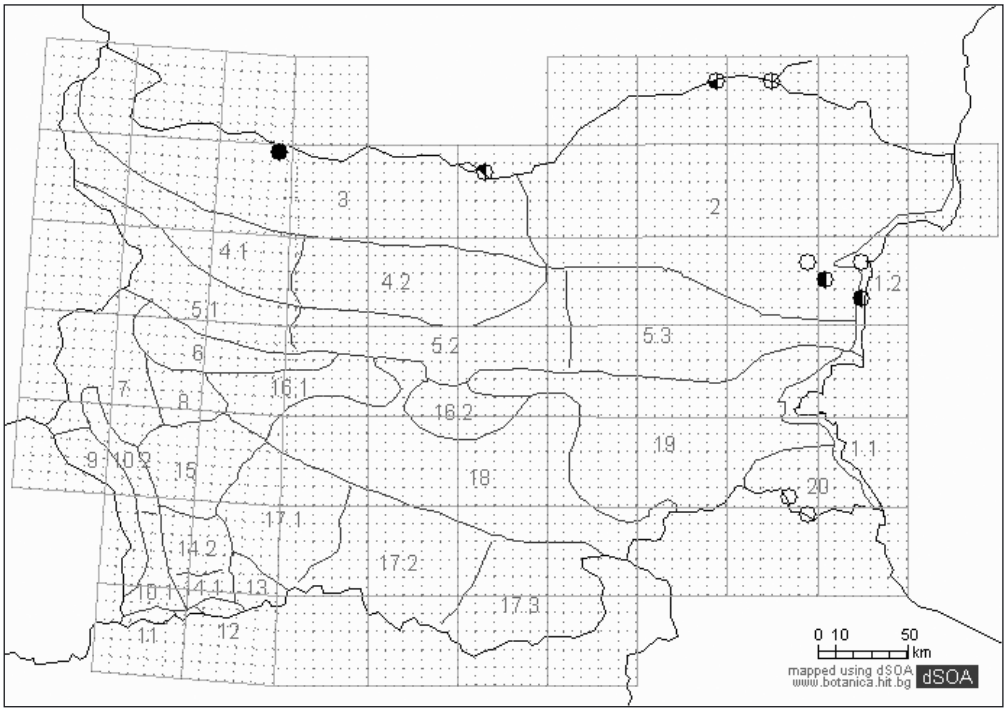

Fig. 1. Distribution map for *R. hydrolapathum*

● – new and unpublished data
◐ – herbarium specimens
○ – literature data

Danubian Plain is based on one herbarium specimen with incomplete chorological information: Danubian Plain: Nikopol district, 110 m, LJ-34, September, (?) (SOA 05205). After revision of the specimen it has been identified as *R. palustris*.

The other herbarium specimen from Bulgarian locality identified as *R. dentatus* is:

Sofia Region: Sofia city, Zapaden Park, 550, FN-82, 27.09.2000, coll. *D. Stoyanov*, (SO 101134).

The specimen is without underground parts and basal leaves. Its morphological features have been compared with these described for *R. dentatus* by Rechinger (1932, 1949) and observed on herbarium specimens from WU (*R. dentatus* subsp. *halascyi* (Rech. f.) Rech. f. (sub *R. obtusifolius* L.), P. Sintenis: Iter orientale, N 4343, 17.06.1892, WU (s.n.) Rehinger fil.; *Rumex dentatus* subsp. *halascyi* Iter Albanicum tertium (sub *R. obtusifolius* L.), 1895, WU (s.n.), rev. Snogerup, 1996). Consequently, we concluded that this specimen belongs to *R. obtusifolius* plants, often misidentified as *R. dentatus.*

In the course of our study, the species has not been discovered in the localities mentioned in the Bulgarian chorological sources. Therefore, so far the participation of *R. dentatus* in the Bulgarian flora remains doubtful.

Rumex palustris **Sm.** (Fig. 2)

Rumex palustris is a hydrophyte that occurs in wet lowlands in Bulgaria. In the Bulgarian floristic literature the species is reported from the Black Sea Coast, NE Bulgaria, Danubian Plain, Balkan Range, Sofia, Znepole and Vitosha Regions, the Valley of River Strouma, Belasitsa and Rila Mts, Mt Sredna Gora, Rhodopi Mts., Thracian Lowland, and Toundzha Hilly Country (see Table 2 for details).

Plants from *R. palustris* have been often misidentified as *R. obtusifolius*, *R. conglomeratus* L. or *R. pulcher* L.:

Black Sea Coast (*Northern*): Devnya, Varna district, 40 m, NH-78, 18.08.1903 (SOM 17662, sub *R. conglomeratus* Murray);

Sofia Region: Sofia city, Mladost residential district, 550 m, FN-92, 16.08.1970 (SO 29882, sub *R. pulcher*);

Thracian Lowland: Boshoulya village, Pazardzhik district, drying pads near the village, 210 m, KG-77, 5.08.1949 (SOM 17758, sub *R. obtusifolius*).

Our observations show that the species grows at higher altitudes than reported in the existing literature (0-300 m). We found it in localities up to 800 m: above Klissoura and Kalofer towns (Central Balkan Range), Dragoman swamp (Znepole Region), and around Iskur dam (Vitosha Region). Presumably, *R. palustris* is more widely distributed near water basins but it has not been reported so far for the flora of Forebalkan (*Eastern*), the Balkan Range (*Eastern*), the Valley of River Mesta, Belasitsa, Slavyanka, Pirin, Rila, and Rhodopi Mts (*Eastern*).

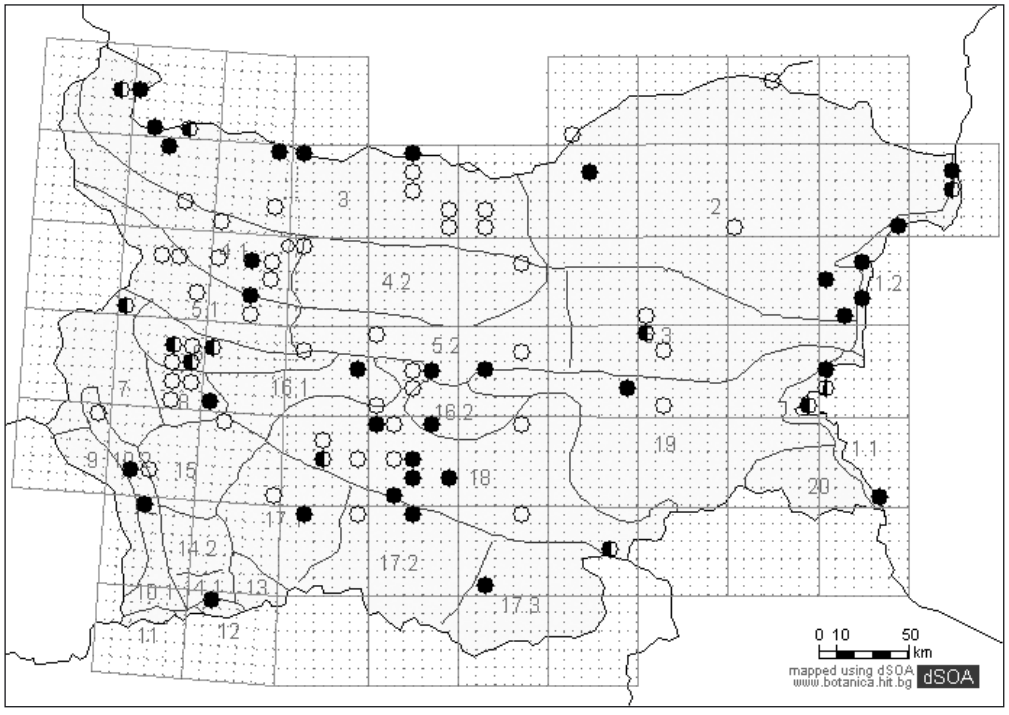

Fig. 2. Distribution map for *R. palustris*

● – new and unpublished data
◐ – herbarium specimens
○ – literature data

***Rumex confertus* Willd.** (Fig. 3)

The only data about the species in Bulgaria were provided by Urumov (1917).

Vitosha Region: in pratis humidis ad Dragalevtsi, 750 m, FN-82, 1921, coll. *I. Urumov* (SOA 17794).

More recently, the species was reported from the Thracian Lowland (Table 2). Our revision of the herbarium specimen from the locality mentioned above confirms that it belongs to *R. confertus*. The same specimen was revised in the herbarium by B. Achtarov and was determined as *R. patientia* L. This probably is the reason why the species has not been included in the Bulgarian floras until 2003 (Delipavlov 2003), where it is given for the Thracian Lowland based on a publication by Latowski (1993). However, no specimens have been deposited in any of the national herbaria from the Thracian Lowland floristic region. Our field observations do not confirm the species for this floristic region.

Revision of the collections in the Bulgarian herbaria has revealed one more specimen that belongs to *R. confertus* mistakenly determined as *R. patientia*:

NE Bulgaria: Razgrad district, along the road to Senovo village, 210 m, MJ-52, 1948, coll. *B. Achtarov*, (SOM 0100165, sub *R. patientia* L.).

In the course of our field studies the species has been registered for the following floristic regions:

NE Bulgaria: Shoumen district, along the road to Strouino village, 241 m, MH-99, 16.08.2005, with fruits, coll. *Tz.* Raycheva), SOA 56934; Razgrad district along the road to Tzar Kaloyan village, very dense populations on the edge of sunflower fields, 210 m a.s.l., MJ-52, 16.08.2005, with fruits, coll. *Tz. Raycheva* (SOA 56932).

Vitosha Region: Shturkelovo Gnezdo tourist complex near the Iskur dam, 820 m, GN-10, 13.09.2005, with fruits, coll. *Tz. Raycheva* (SOA 56933); along river Iskur, near Zlokouchene village, 880 m, GM-09, 13.09.2005, with fruits, coll. *Tz. Raycheva* (SOA 56935).

In the northern parts of Europe and European Russia, *R. confertus* is known as an aggressive ruderal species that is widely distributed in wet meadows, along roads and in urban areas. Borodina (1979) treats it as an edificator of herbaceous associations. Although *R. confertus* is known only from few Bulgarian localities, presumably its distribution can be more extended due to its effective reproductive capacity and adaptiveness to different ecological conditions (Larin & al. 1951).

***Rumex cristatus* DC.** (Fig. 4)

This species was reported for the first time for the Bulgarian flora by Panov (1987), from Black Sea Coast (*Northern* and *Southern*). More recently it is reported for the Valley of Strouma River (Table 2). Our field work confirms its wide distribution along the Black Sea Coast. The species has been registered by us also in Valley of Strouma River (*Southern*), and Rhodopi Mts

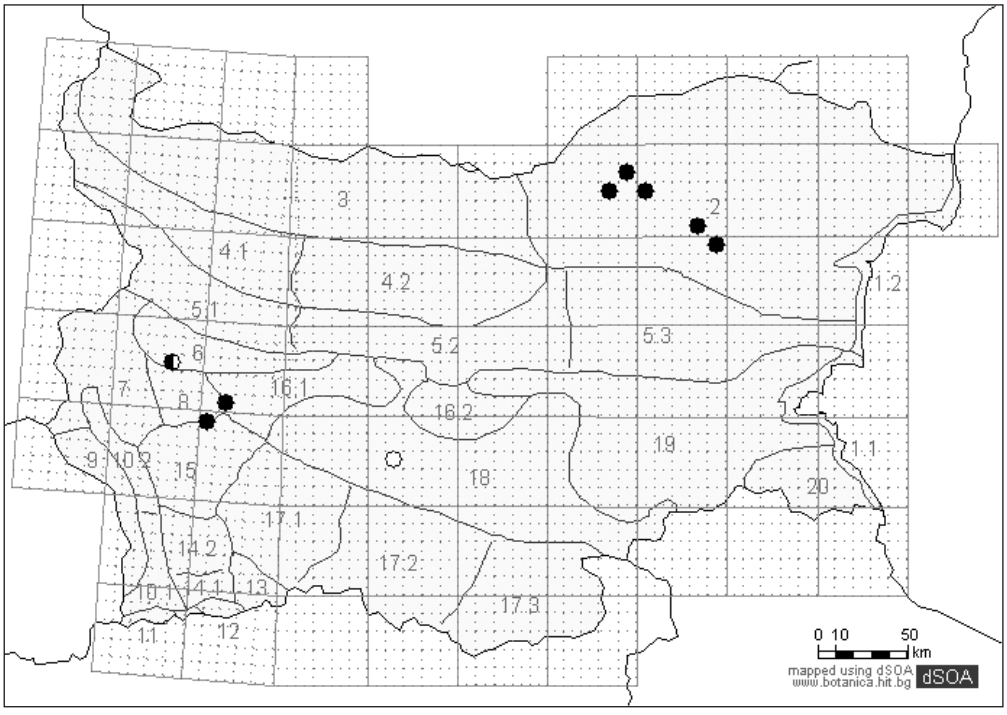

Fig. 3. Distribution map for *R. confertus*

● – new and unpublished data
◐ – herbarium specimens
○ – literature data

(*East*). It occupies waste places in the urban areas, at altitudes up to 477 m, and behaves as a ruderal species.

Valley of Strouma River (*Southern*): Roupite locality, grassy places along the road to Vanga's church, 147 m, FL-89, 18.06.2005, with fruits, coll. *Tz. Raycheva* (SOA 56940); under the railway bridge near Skalata height, to the South of Damyanitsa station, 152 m, FL-99, 09.06.2005, coll. *D. Dimitrov* (SOM 162328, unpubl. data);

Pirin Mts (*South*): village Gorno Spanchevo, 477 m, GL-09, 18.06.2005, with fruits, coll. *Tz. Raycheva* (SOA 56941).

Rhodopi Mts (*Eastern*): ruderal places near Mandritsa village, together with *R. obtusifolius* and *R. patientia*, 100 m, MF-28, 15.07.2005, with fruits, coll. *Tz. Raycheva* (SOA 56938); ruderal places near Odrintsi village and within the village, 90 m, MF-28, 15.07.2005, with fruits, coll. *Tz. Raycheva* (SOA 56943); in pastures and yards near Svirachi village, Ivailovgrad region, 235 m, MF-29, 15.07.2005, coll. *Tz. Raycheva* (SOA 56937); Rogach village, Kroumovgrad region, together with *R. crispus* and *R. patientia*, 272 m, LF-99, 14.07.2005, with fruits, coll. *Tz. Raycheva* (SOA 56942).

Assyov & Petrova (2006) report this species for the entire floristic region of the Valley of Strouma River, but so far it has not been located in the northern subregion, therefore its chorology has to be restricted only to the southern subregion.

Considering the fact that the species is very adaptive and has ruderal characteristics, it can possibly have a wider distribution in Bulgaria and can even extend its area in the country.

***Rumex alpinus* L.** (Fig. 5)

According to the Bulgarian botanical literature, the species is distributed in all high mountains of Bulgaria (See Table 2 for details). The existing specimens in the national herbaria do not confirm the species for the flora of the Forebalkan and Mt Sredna Gora. The species shows a wider altitude range than the one reported in literature and grows from 530–750 up to 2925 m.

***Rumex conglomeratus* Murray** (Fig. 6)

According to the Bulgarian botanical literature, this species behaves as a ruderal species and occurs all over Bulgaria (Table 2). It grows in various habitats. Literature data show that it reaches up to 2000 m. Our field observations reveal a lower altitude range: from the sea level up to 1500 m. Despite the information about its wide distribution, no collections have been deposited in the Bulgarian herbaria from the Valley of River Mesta, Mt Belasitsa and Mt Slavyanka, Pirin Mts (*Southern*), Rhodopi Mts (*Eastern*), and Mt Sredna Gora (*Eastern*). The wide distribution of the species in Bulgaria corresponds to the fact that *R. conglomeratus* has a cosmopolitan distribution and is among the

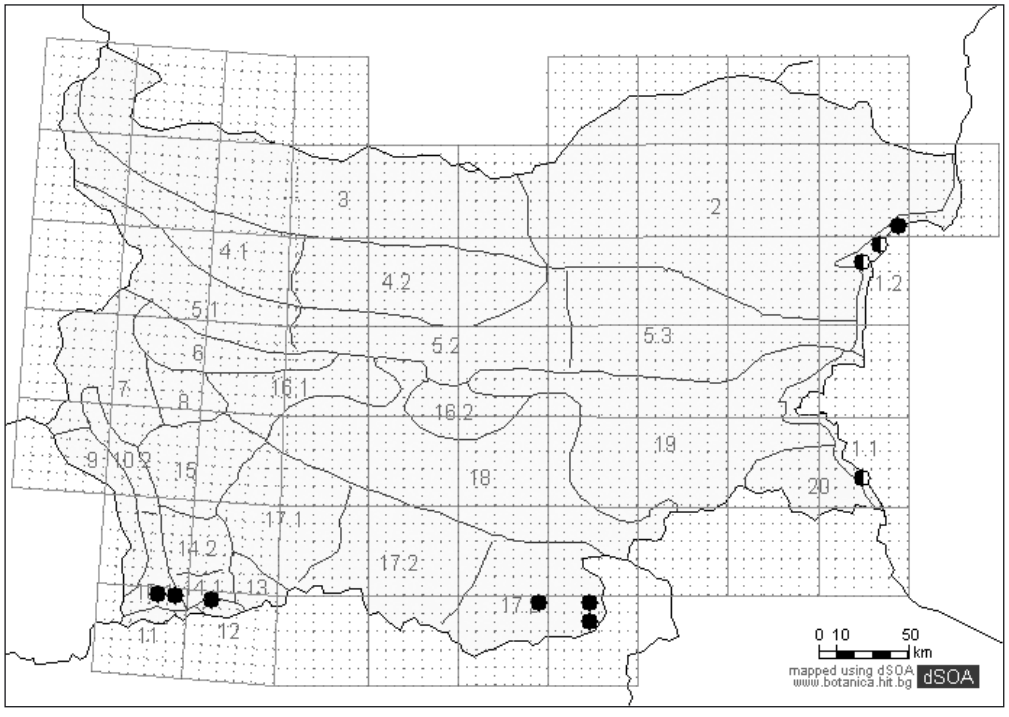

Fig. 4. Distribution map for *R. cristatus*

● – new and unpublished data
◐ – herbarium specimens
○ – literature data

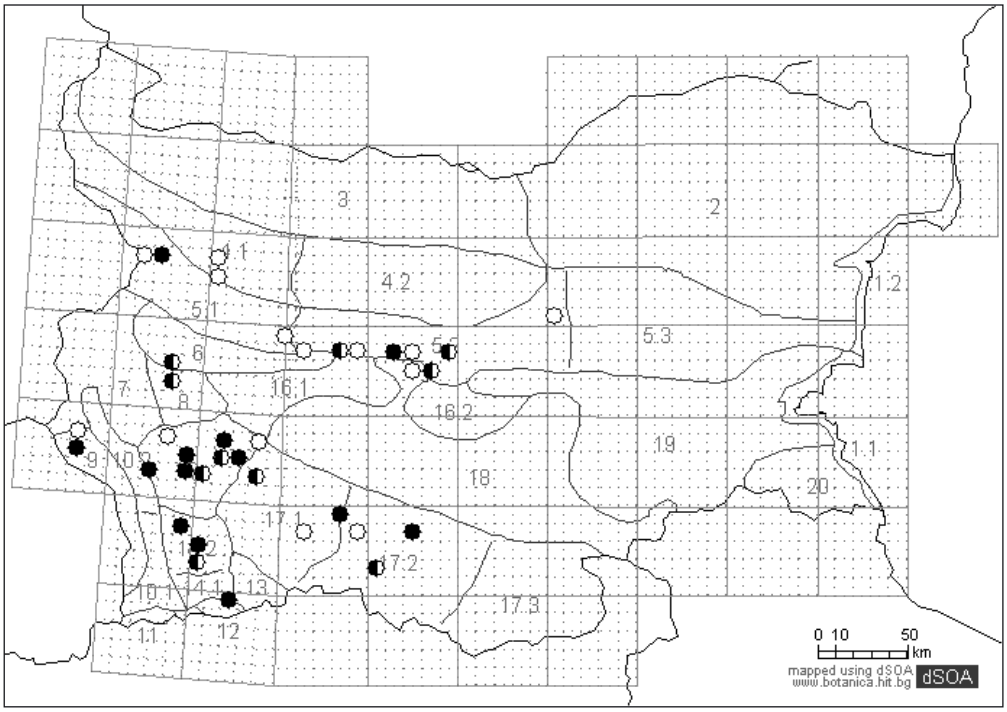

Fig. 5. Distribution map for *R. alpinus*

● – new and unpublished data
◐ – herbarium specimens
○ – literature data

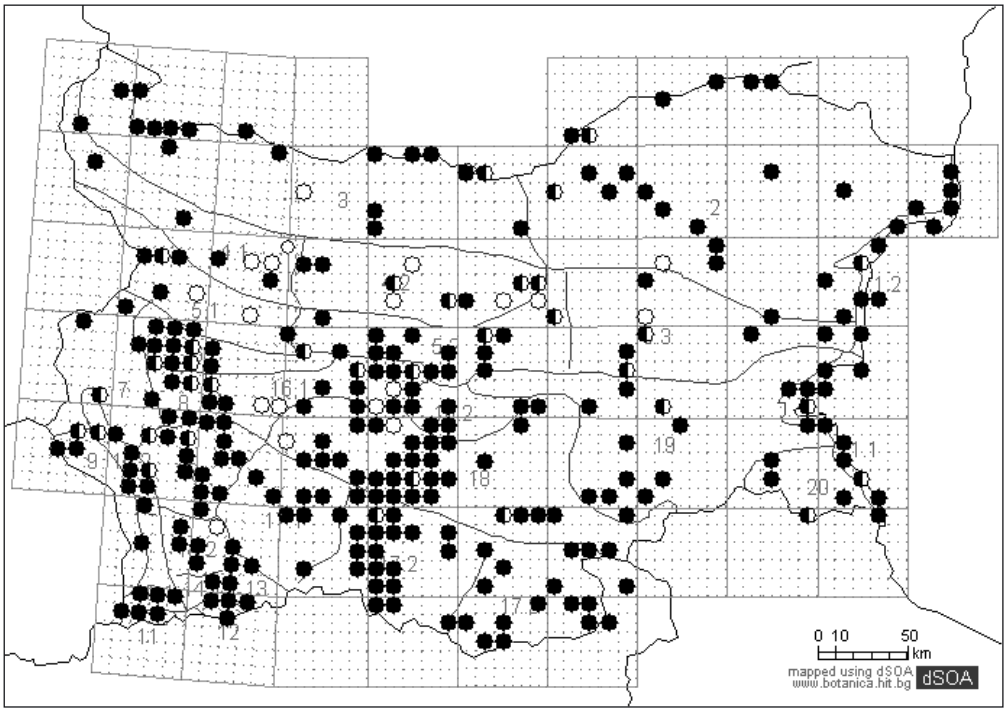

Fig. 6. Distribution map for *R. conglomeratus*

● – new and unpublished data
◐ – herbarium specimens
○ – literature data

widest-spread dock species in the world. It occurs in Europe, Asia, Africa and America.

***Rumex sanguineus* L.** (Fig. 7)

Although, it is a relatively frequent species in the Bulgarian flora, this dock is restricted mainly to open forest coenoses along the Black Sea Coast (*Southern*), NE Bulgaria, Danubian Plain, Forebalkan, Balkan Range, Sofia and Vitosha Regions, West Frontier Mts, Rila and Rhodopi Mts, and Mt Strandzha (Table 2). The existing herbarium specimens and personal collections indicate a wider distribution regarding the number of floristic regions where it is registered. Until our study, there have been no available records of the distribution of the species along the Black Sea Coast (*Southern*) and Rhodopi Mts (*Western*).

According to the Bulgarian Floras, the species reaches up to 1000 m, but in the Balkan Range (Zlatitsa pass) and Rhodopi Mts (*Central*) (deciduous forests above Chepelare) *R. sanguineus* has been found at higher altitudes: 1100 and 1232 m, respectively.

***Rumex stenophyllus* Ledeb.** (Fig. 8)

In the Bulgarian floristic literature this species has been reported from the Danubian Plain (Svishtov district), Black Sea Coast (*Northern*) (river Kamchia) and Mt Strandzha (Table 2). There are few specimens deposited in the Bulgarian herbaria. One of them (SO 17591) identified by Rechinger in 1933 as *R. stenophyllus* lacks information about its locality and collector. Although in some floristic literature (Andreev 1992, Delipavlov 2003, Assyov & Petrova 2006) the species is reported for the entire Black Sea Coast, there is no evidence that it occurs in its southern part. One herbarium specimen supports the distribution of the species along the Black Sea Coast (*Northern*): on sandy places around Dourankoulak lake, 20 m, PJ-23, 11.08.1996, coll. *M. Filipova* & *D. Stoyanov* (SO 98430).

No data confirm the distribution of this species along river Kamchia. The existing herbarium specimens and personal collections confirm the distribution of the species also in NE Bulgaria and the Danubian Plain:

NE Bulgaria: Hadzhi Dimitrovo village, fisheries, LJ-71, 10.2000, coll. *R. Tsonev* (SO 101311); the port of Popina village on the Danube, 40 m, MJ-98, 19.06.2004, with fruits coll. *Tz. Raycheva* (SOA 57061); along the river bank at Rousse, Prista challet, 40 m, MJ-15, 04.08.2004, with fruits, coll. *Tz. Raycheva* (SOA 57060); on the bank of the Danube near Silistra, 25 m, NJ-28, 04.08.2004, coll. *Tz. Raycheva* (SOA 57059);

Danubian Plain: near Svishtov, 50 m, LJ-63, 17.09.1929, coll. *N. Stojanov* (SOA 3052); Dubovan village, Goulyantsi Municipality, 50 m, LJ-04, 09.2002, coll. *R. Tsonev* (SO 101187); Lom, on the bank of the Danube, 50 m, FP-75, 06.09.2004, coll. *Tz. Raycheva* (SOA 57062); Archar village, Vidin district, on the bank of the Danube, 70 m, FP-55, 06.09.2004, coll. *Tz. Raycheva* (SOA 57063).

The species occurs frequently along the Danube. Extension of its distribution along the Black Sea Coast could be expected.

Conslusions

The present study is a contribution to the critical reassessment of the chorology of *Rumex* subgenus *Rumex* in Bulgaria. For the first time the available information from literature and herbaria and the data from the authors' study are mapped for the territory of Bulgaria. As a result from this study, the occurrence of *R. dentatus* in the Bulgarian flora has not been confirmed. Taxonomic revision and field studies verify the participation of *R. confertus* in the Bulgarian flora.

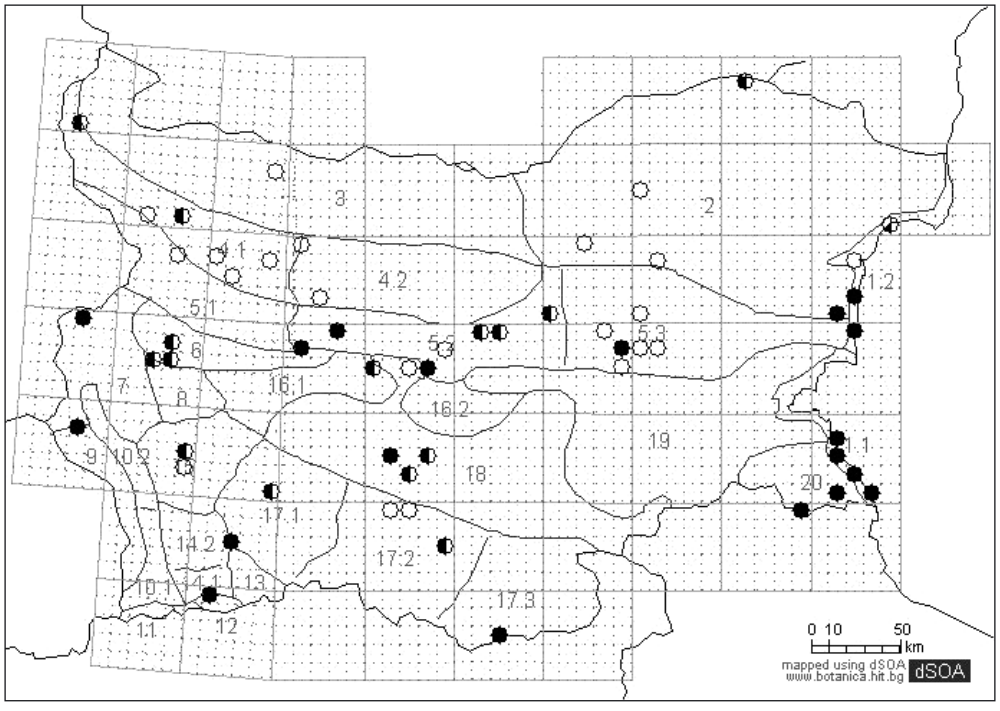

Fig. 7. Distribution map for *R. sanguineus*

● – new and unpublished data
◐ – herbarium specimens
○ – literature data

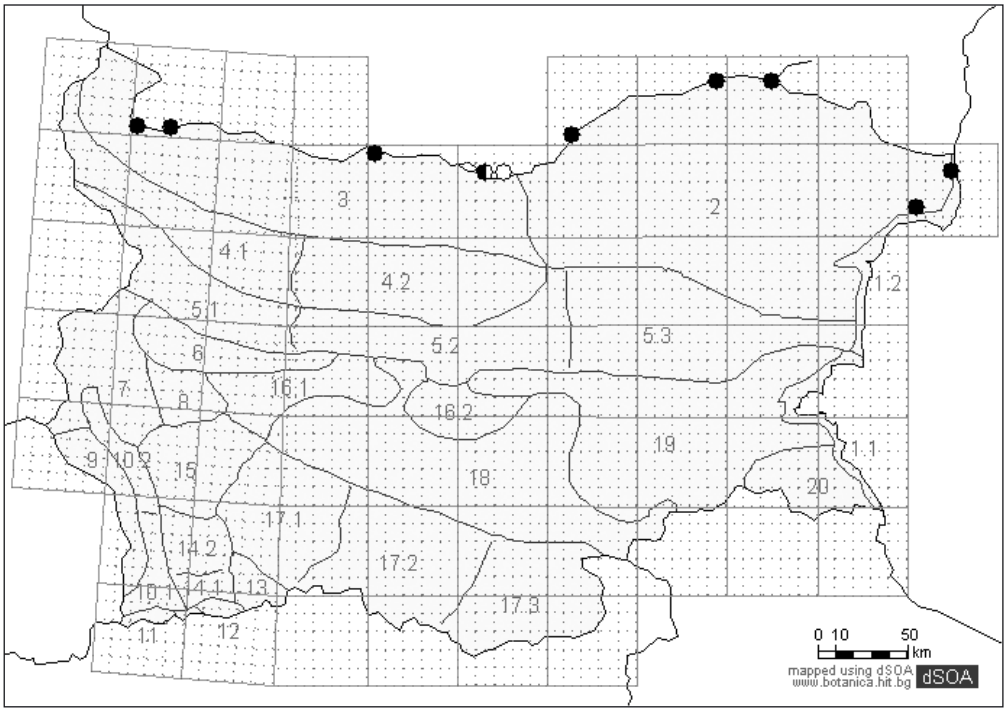

Fig. 8. Distribution map for *R. stenophyllus*

● – new and unpublished data
◐ – herbarium specimens
○ – literature data

Table 2. Chorological data on some species of *Rumex* subg. *Rumex* in Bulgaria:

Distribution in floristic regions and altitude			
Literature data		Herbarium specimens	
Floristic region, author, year	Altitude	Floristic region	Altitude
R. hydrolapathum			
1 (**Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **1.2** (Bornmüller 1888; Velenovský 1891; Toshev 1895; Davidov 1905, 1909; **Stojanov & Stefanov 1924, 1933, 1948; **Stojanov & al. 1966; **Vulev 1966); **2** (Baeva 1992); **3** (**Stojanov & Stefanov 1933; 1948; **Stojanov & al. 1966; **Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **6** (**Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **20** (Gussev & al. 1997, 1998; **Delipavlov 2003; **Assyov & Petrova 2006)	up to 400–600 m	1.2; 2; 3	up to 120 m
R. dentatus			
3 (**Stojanov & Stefanov 1948; **Stojanov & al. 1966; **Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **6** (**Delipavlov 2003; **Assyov & Petrova 2006)	up to 100 m	–	–
R. palustris			
1 (**Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **1.1** (Urumov 1908c); **1.2** (Bornmüller1888; Velenovský 1891; Toshev 1895; Davidov 1905; Rechinger 1933); **2** (Urumov 1901, 1905b; Kovachev 1903; Baeva 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **3** (Urumov 1901, 1902, 1910, 1917, 1926, 1928, 1935; Kovachev 1903; Rechinger 1933; **Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **4.1** (Urumov 1917, 1935); **4.2** (Urumov 1928); **5.1** (Urumov 1905b, 1935; Rechinger 1933); **5.2** (Neichev 1908; Urumov 1926, 1928; Baev 1947;); **5.3** (Urumov 1909); **6** (Velenovský 1891; Urumov 1906, 1910; Dimitrov & Gussev 1995; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **7** (Urumov 1905b, 1913; Rechinger 1933; **Vâlev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **8** (Urumov 1930); **9** (Urumov 1906); **10** (Urumov 1904, 1913; **Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **11** (**Delipavlov 2003; **Assyov & Petrova 2006); **15** (Urumov 1908a); **16.1** (Urumov 1908a, 1929b; **Assyov & Petrova 2006); **17.1** (Urumov 1906, 1908a; **Vâlev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **17.2** (Toshev 1902; Urumov 1913); **17.3** (**Assyov & Petrova 2006); **18** (Velenovský 1891, 1898; Urumov 1906, 1908c, 1910; 1913, 1917, 1929b; **Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **19** (Urumov 1908c, 1910) *Reported by Stojanov & Stefanov (1948) and Stojanov & al. (1966) as frequent species for swampy and marshy places in lowlands.*	up to 300 (900) m	1.1; 1.2; 2; 3;4.1; 4.2; 5.1; 5.2; 5.3; 6; 7; 8; 10; 11; 14.1*; 16.1; 16.2*; 17.2; 17.3; 18; 19	up to 820 m
R. confertus			
6 (Urumov 1917); **18** (Latowski 1993, **Delipavlov 2003; **Assyov & Petrova 2006)	up to 200 m	2*; 8*	up to 880 m

R. cristatus **1** (**Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **1.1** (Panov 1987); **1.2** (Panov 1987); **10** (**Assyov & Petrova 2006)	up to 100 m	1.1; 1.2; 10.1*; 14.1*; 17.3*	from 0 up to 500 m
R. alpinus **4** (Urumov 1905a; **Delipavlov 2003; **Assyov & Petrova 2006); **4.2** (**Assyov & Petrova 2006); **5** (**Vulev 1966; **Delipavlov 2003); **5.1** (Urumov 1902; Jordanov 1924; **Stojanov & al. 1966; **Assyov & Petrova 2006); **5.2** (Urumov 1898a, 1901, 1902, 1904, 1905b, 1906, 1910, 1929b; Neichev 1908; Baev 1947; Kiryakov & al. 1951; **Stojanov & al. 1966; **Assyov & Petrova 2006); **7** (**Stojanov & al. 1966; **Delipavlov 2003; **Assyov & Petrova 2006); **8** (Javashov 1890; Urumov 1930; **Stojanov & al. 1966; **Vulev 1966; Stoeva 1987; Filipovich 1988; **Delipavlov 2003; **Assyov & Petrova 2006); **9** (**Delipavlov 2003; **Assyov & Petrova 2006); **11** (**Delipavlov 2003; **Assyov & Petrova 2006); **12** (**Vulev 1966; **Delipavlov 2003; **Assyov & Petrova 2006); **14** (Urumov 1923; **Vulev 1966; **Stojanov & al. 1966; **Delipavlov 2003; **Assyov & Petrova 2006); **15** (Georgiev 1891; Urumov 1906; Rechinger 1933; **Stojanov & al. 1966; **Vulev 1966; **Delipavlov 2003; **Assyov & Petrova 2006); **16** (**Delipavlov 2003)**; 16.1** (Urumov 1905a, 1908a; **Vulev 1966; **Assyov & Petrova 2006); **16.2** (**Assyov & Petrova 2006); **17** (**Vulev 1966; **Delipavlov 2003); **17.1** (Urumov 1906, 1917; **Stojanov & al. 1966; **Assyov & Petrova 2006); **17.2** (Urumov 1908a, 1913; **Stojanov & al. 1966; **Assyov & Petrova 2006); **17.3** (Urumov 1913; **Assyov & Petrova 2006); *Reported by Velenovský (1891) as frequent in mountain meadows and pastures. Reported by Stojanov & Stefanov (1948) for wet and stony places and along mountain streams in all high mountains of Bulgaria and by Andreev (1992) for grassy stony places, along rivers, streams and around chalets in the mountains from 1400 to 2200 m.*	from 1400 up to 2200-2400 m	5.1; 5.2; 8; 9; 12; 14.2; 15; 17.1; 17.2	from 530 up to 2925 m
R. conglomeratus **1.1** (Urumov 1908c; Panov 1987); **1.2** (Velenovský 1891; Urumov 1908c; Rechinger 1933); **2** (Urumov 1901; Rechinger 1933; Baeva 1992); **3** (Urumov 1901, 1902, 1910, 1917, 1926, 1928. 1935; Rechinger 1933); **4.1** (Urumov 1905a, 1910, 1935); **4.2** (Velenovský 1898; Urumov 1897, 1898a, 1901, 1926, 1928); **5.1** (Urumov 1906; Rechinger 1933); **5.2** (Urumov 1898b; Neichev 1908; Baev 1947); **5.3** (Velenovský 1891; Urumov 1909); **6** (Velenovský 1891; Urumov 1905b, 1906, 1908a, 1909, 1910, 1926); **7** (Urumov 1913, 1935); **8** (Urumov 1908a, 1929a, 1930); **10** (Urumov 1904); **13** (Urumov 1923); **15** (Velenovský 1891; Urumov 1906); **16.1** (Baev 1947; Urumov 1904, 1908a, 1929b, 1935); **17.2.** (Urumov 1913); **18** (Velenovský 1891; Urumov 1908c, 1913, 1917, 1929); **19** (Urumov 1908b, 1910); **20** (Gussev & al. 1997) *Reported by Stojanov & Stefanov (1948), Stojanov & al. (1966), Vâlev (1966), Andreev (1992), Delipavlov (2003) and Assyov & Petrova (2006) for the whole country, mostly in wet places.*	up to 2000 m	1.1; 1.2; 2; 3; 4; 5.1; 5.2; 5.3; 6; 7; 8; 9*; 10; 11*; 12*; 13; 14.1*; 15; 16.1; 16.2*; 17.1; 17.2; 17.3*; 18; 19; 20	up to 1500 m
R. sanguineus **1** (**Delipavlov 2003; **Assyov & Petrova 2006); **1.2** (Javashov 1890; **Stojanov & Stefanov 1933); **2** (Yavashov 1890; Urumov 1901, 1904; **Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **3** (Urumov 1935; **Andreev 1992); **4.1** (Kovachev 1905; Urumov 1917, 1935); **4.2** (Urumov 1917); **5** (**Stojanov & Stefanov 1924; **Vâlev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **5.1** (Urumov 1917); **5.2** (Neicev 1908; Urumov 1910, 1917, 1928, 1929b); **5.3** (Velenovský 1891; Urumov 1909); **6** (**Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **8** (Ganchev 1953; **Vâlev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **9** (Kovachev 1905); **15** (Rechinger 1933; **Vulev 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **17** (**Stojanov & Stefanov 1924); **17.2** (Urumov 1913); **18** (Urumov 1910); **20** (**Vulev 1966; **Andreev 1992; Gussev & al. 1997; **Delipavlov 2003; **Assyov & Petrova 2006) *Reported by Stojanov & Stefanov (1948) and Stojanov & al. (1966) for forests and shadowy places in different parts of the country.*	up to 1000 m	1.1*; 1.2; 2; 3; 4.1; 4.2; 5.2; 5.3; 6*; 8; 9; 13*; 14*; 15; 16.1*; 17.1*; 17.2; 17.3*; 18; 20	up to 1200 m
R. stenophyllus **1** (**Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **1.2** (**Vulev 1966); **3** (Stojanov 1932; **Stojanov & Stefanov 1933, 1948; **Stojanov & al. 1966; **Andreev 1992; **Delipavlov 2003; **Assyov & Petrova 2006); **20** (**Assyov & Petrova 2006)	up to 200 m	1.2; 2*; 3	up to 120 m

1, Black Sea Coast (**1.1**. *Southern*, **1.2**. *Northern*); **2,** NE Bulgaria; **3,** Danubian Plain; **4,** Forebalkan (**4.1.** *Western*, **4.2.** *Eastern*); **5,** Balkan Range (**5.1**. *Western*, **5.2**. *Central*, **5.3.** *Eastern*); **6,** Sofia Region; **7,** Znepole Region; **8,** Vitosha Region; **9,** West Frontier Mts; **10,** the Valley of Strouma River (**10.1**. *Southern*, **10.2**. *Northern*); **11,** Belasitsa Mts; **12,** Slavyanka Mts; **13,** the Valley of Mesta River; **14,** Pirin Mts (**14.1.** *Southern*, **14.2.** *Northern*); **15,** Rila Mts; **16,** Mt Sredna Gora (**16.1.** *Western*, **16.2**. *Eastern*); **17,** Rhodopi Mts (**17.1** *Western*, **17.2**. *Central*, **17.3**. *Eastern*); **18,** Thracian Lowland; **19**, Toundzha Hilly Country; **20,** Mt Strandzha (*new data; ** the taxon is reported for the respective floristic region without specific locality).

Acknowledgements: This study is financially supported by the National Council for Scientific Research, Project VUB 10/5. The authors express special thanks to the anonymous reviewer for the valuable suggestions and comments on the manuscript.

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