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New record of *Rubus phoenicolasius* Maxim. (Rosaceae) for the flora of Bulgaria

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Abstract. The article provides information about the new finding for Bulgaria (Vitosha Mountain Range) of an East Asian species *Rubus phoenicolasius* Maxim., invasive for Europe and North America.

Key words: alien species, Bulgaria, floristic findings, *Rubus phoenicolasius*.

The genus *Rubus* L. includes about 750 species (Thompson, 1995) distributed in all continents except Antarctica (Hummer, 1996). The genus is economically and ecologically important as fruit crops, ornamentals, invasive weeds, and a member in the early forest succession (Howarth et al., 1997; Alice, Campbell, 1999). *Rubus* has long been deemed taxonomically challenging due to apomixis, polyploidy, lack of a universal species concept, and frequent hybridization (Thompson, 1997; Wang et al., 2016). The most recent global taxonomical revision of *Rubus* was given by W.O. Focke (1914), where the genus was divided into 12 subgenera and the numerous sections and series (Alice, Campbell, 1999; Wang et al., 2016). The *Rubus* section *Idaeobatus* Focke includes 88 species that are shrubs, rarely sub-shrubs or herbs, usually with robust or needle-like prickles. Leaves pinnately or palmately compound, (3–)5–11(–15)-foliolate, or simple; stipules persistent, mostly adnate to petiole base, narrower than petiole, rarely broader, undivided, sometimes lobed. Flowers bisexual, in cymose panicles, subracemes or corymbs, rarely several in clusters or solitary. Aggregate fruit separating from torus at maturity, hollow (Lingdi, Boufford, 2003).

A species *Rubus phoenicolasius* was found in Bulgaria at the foot of the Vitosha Mountain Range (Bulgaria) above the Sofia quarter of Simenovo during fieldwork in the summer of 2014 (Tashev, 2020). Previously, this species was not known from in Bulgaria. Our attention was attracted by the leaves and stems of the plant covered with a dense layer of emergences and glandular hairs that are unusual for Bulgarian representatives of *Rubus*. According to a phylogenetic study (Yang et al., 2012), *R. phoenicolasius* belongs to section *Idaeocanthi* (name of section is absent in “International Plant Name Index”, www.ipni.org), and is now understood as the section

Idaeobatus (Lingdi, Boufford, 2003). J.Y. Yang et al. (2012) included in this group *R. coreanus* Miq., *R. idaeus* L., *R. parvifolius* Thunb., and *R. phoenicolasius* Nakai. The last species was firstly described by C.J. Maksimovich.

The belonging of the discovered *Rubus* to *R. phoenicolasius* is determined in accordance with the following description given in the “Flora of China” (Lingdi, Boufford, 2003).

Rubus phoenicolasius Maxim., 1872, Bull. Acad. Imp. Sci. Saint-Petersbourg, ser. 3., 17: 160.

Shrubs 1–3 m tall. Branches upright at first, finally scrambling, densely pubescent, with intermixed reddish brown bristles, stalked glands, and sparse prickles. Leaves imparipinnate, 3-foliolate, rarely 5-foliolate; petiole 3–6 cm, petiolule of terminal leaflet 2–3 cm, lateral leaflets subsessile, petiolule and rachis pubescent, with intermixed reddish-brown bristles, stalked glands, and sparse prickles; stipules linear, 5–8 mm, pubescent, with intermixed glandular hairs; the blade of leaflets ovate, broadly ovate, or rhombic, rarely elliptic, 4–8(–10) × 2–5(–7) cm, abaxially densely grey tomentose, bristly, stipitate glandular, with sparse, minute needle-like prickles, adaxially appressed pubescent or pubescent only along veins, base rounded to subcordate, margin irregularly rough serrate, usually incised, terminal leaflet often lobed, apex acute to acuminate. Inflorescences terminal or axillary, short racemes, few-flowered, terminal racemes 6–10 cm, lateral ones shorter; rachis, pedicels, and abaxial surface of calyx densely pubescent, bristly, stipitate glandular; bracts lanceolate, 5–8 mm, pubescent, stipitate glandular, margin entire or apically 2-lobed. Pedicel 0.5–1.5 cm. Flowers 6–10 mm in diam. Sepals erect, lanceolate, 1–1.5 cm × 4–7 mm, apex caudate. Petals are purplish-red, obovate-spatulate or suborbicular, much longer than sepals, base long-clawed and pubescent. Stamens numerous, nearly as long as petals or slightly shorter. Pistils somewhat longer than stamens; ovary glabrous or puberulous. Aggregate fruit orange or red, subglobose, ca. 1 cm in diam., glabrous; pyrenes prominently rugose, pitted (Lingdi, Boufford, 2003).

According to “Flora of Bulgaria”, there are 44 species of the genus *Rubus* (Markova, 1973) in the country; “Flora Europaea” includes 75 representatives of this genus divided into 9 subgenera (Heslop-Harrison, 1981). Morphologically, the newly discovered species of the genus *Rubus* (*R. phoenicolasius*) is similar to *R. idaeus* in fruit colour and similar to *R. glandulosus* in pubescence with glandular hairs. At the same time, it has significant differences from *R. idaeus* in the shape of the leaves and texture of the outer surface of the fruits. The fruits in *R. idaeus* are red and matte, in *R. phoenicolasius* they are orange or red and shiny. The branches and twigs in *R. idaeus* are almost glabrous or slightly hairy, branches in *R. phoenicolasius* are densely covered with glandular hairs and spines. The differences between *R. glandulosus* and *R. phoenicolasius* are obvious: the aggregate fruits in the first species are black; in the newly found species the fruits are red. Leaves in the first species are scattered hairy, and in the second one, are densely covered with glandular hairs and spines.

According to “Flora Europaea” (Heslop-Harrison, 1981), *R. phoenicolasius* is naturalized in Austria, Great Britain, the Czech Republic, Germany, Switzerland, as well as in North America. The species is used as a decorative and fruity shrub because of its high decorative characteristics and taste qualities of fruits. Our six-year observations of the locality in Vitosha Nature Park show that *R. phoenicolasius* has successfully naturalized in Bulgaria as well.

The locality of *Rubus phoenicolasius* is situated in a three-storey plant community, where the dominants are also edificators, that were afforested decades ago. The floristic description was made on July 5, 2019. The first storey is represented by adult individuals of *Pinus nigra* J.F. Arnold and *Quercus rubra* L. The second storey is formed exclusively by undergrowth of tree species and shrubs. The undergrowth is formed from *Quercus rubra* L., *Q. dalechampii* Ten., *Acer campestre* L., *A. hyrcanum* Fisch. et C.A. Mey, *A. platanoides* L., *A. pseudoplatanus* Falk, *A. tataricum* L., *Carpinus betulus* L., *C. orientalis* Mill., *Corylus avellana* L., *Clematis vitalba* L., *Cornus mas* L., *C. sanguinea* L., *Crataegus monogyna* Jacq., *Fagus sylvatica* L., *Juglans regia* L., *Laburnum anagyroides* Medik., *Ligustrum vulgare* L., *Prunus avium* (L.) L., *P. cerasifera* Ehrh., *Rosa canina* L., *Rubus hirtus* Rchb., *Sorbus aucuparia* L., *Tilia platyphyllos* Scop., *Viburnum lantana* L. The third storey consists of young undergrowth of trees and shrubs and the herbaceous plants: *Festuca gigantea* (L.) Vill., *Brachypodium sylvaticum* (Huds.) P. Beauv., *Poa nemoralis* L., *Astragalus glycyphyllos* L., *Campanula rapunculoides* L., *Cardamine bulbifera* (L.) Crantz, *Centaurea phrygia* L., *Fragaria vesca* L., *Galium aparine* L., *G. odoratum* (L.) Scop., *G. pseudoaristatum* Schur, *Geum urbanum* L., *Helleborus odoratus* Waldst. et Kit. ex Willd., *Lathyrus niger* (L.) Bernh., *L. vernus* (L.) Bernh., *Mycelis muralis* (L.) Dumort., *Pteridium aquilinum* (L.) Kuhn, *Sanicula europaea* L., *Silene alba* Muhl. ex Rohrb., *Verbascum* sp., *Viola hirta* L., *V. riviniana* Rchb., etc.

New record of *Rubus phoenicolasius*: Bulgaria, Sofia, Vitosha Mountain Range, above the Sofia quarter of Simeonovo, 42°36'38.2" N, 23°19'19.8" E, 960 alt. 23.06.2015; 21.07.2015. A. Tashev (SOM-177004, SOM-177005).

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Новая для флоры Болгарии находка *Rubus phoenicolasius* Maxim. (Rosaceae)

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Аннотация. В статье приведены сведения о новой находке для Болгарии: София, горный массив Витоша, над Софийским кварталом Симеоново, 42°36'38.2" с.ш., 23°19'19.8" в.д., 960 над ур. м. 23.06.2015. 21.07.2015. А. Ташев (SOM-177004, SOM-177005) восточноазиатского, инвазивного для Европы и Северной Америки вида – *Rubus phoenicolasius* Maxim.

Ключевые слова: Болгария, флористические находки, чужеродный вид, *Rubus phoenicolasius*.

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