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***Cynoglossum germanicum* (Boraginaceae) – an endangered species in Bulgarian flora**

Abstract

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Cynoglossum germanicum Jacq. (*C. montanum* Lam. non Hayek) is a species so far found only once in the territory of the Republic of Bulgaria in July 1899, by Nejčev, I. (1908) in the Central Balkan Mountain (the region of Gabrovo, the Shipchenska Planina Range, in the locality of Malusha).

The species is enlisted in the Bulgarian Red Data Book (Evstatieva 1984) as an extinct.

C. germanicum is legally protected by the Biological Diversity Act. Annex 3 (2007).

The current publication reports finding for the second time of *C. germanicum* Jacq. It occurs in shady and wooded places within the mesophylic beech belt at about 1000 m altitude.

Keywords: *Cynoglossum germanicum*, Bulgaria, Red list.

Introduction

So far in the territory of Bulgaria the species *Cynoglossum germanicum* Jacq. (Green Hound's-tongue) has been found only once by the Bulgarian botanist Ivan Nejčev in the Shipchenska Planina Range – a part of the Central Balkan Mountain, in the locality of Malusha, the region of Gabrovo, in 1899 (Herb. specimen SOM 58993) and published in his work in 1908. However there exist inaccuracies in the Bulgarian scientific literature as regards the precise year when that species was found for the first time in Bulgaria. According to Evstatieva (the Red Data Book of the Republic of Bulgaria, vol. I, 1984), the species is reported in the Shipchenska Planina Range by Nejčev in 1903. Later Peev (1989) and erroneously points out that the species has been found a single time in 1907 in the above mentioned locality. The green hound's-tongue is included in the Bulgarian Red Data Book of the Republic of Bulgaria within the category “extinct” (Evstatieva 1984).

The geographical range covers Western and Central Europe, reaching South Italy, Bulgaria and Ukraine. It is also spread in South-Western Asia and the Caucasus. In North America – adventively.

The species grows in shady forested areas between 900 and 1000 m a.s.l. on rocky humid places. So far it has been estimated only on limestone. It is distributed mosaic, as on separate small locations within the habitat, in the grass vegetation it is a sub-dominant. Entomophylic cross-pollinating plants, propagating with seeds. Seeds germinate in the end of summer. Plants hibernate as rosettes (Fig. 1) and in April – May bring out their floriferous stems. The population is viable and in good density.

Comparison between the description of the species as given by Peev (1989) and the one of the herbarium samples collected in the summer of 2006 and 2007

***Cynoglossum germanicum* Jacq. 1767 (*C. montanum* Lam. non Hayek)**

Biennial herbaceous plant. Stalk 30-80 cm tall, about 0,5 cm thick in diameter, upright, simple, rarely branched at the upper section, unevenly leaved, at the base with residuals of dead leaves, randomly elongated simple (diffuse) hairy (Fig. 2).

Petioles of the rosette and of the basal stalk leaves are 3-6 cm long, narrow-winged, diffuse simple hairy. Leaves 3-10 cm long, 2-3,5 cm wide, broadly elliptic, elliptic, pointed at top, margins entire, along margins flagellated, hairless above, rarely solitary simple hairy. According literary references leaves underneath are sparsely adherent simple hairy.

Stalk leaves are 5-15 cm long and 3-4,5 cm wide, becoming small upwards, unstalk, hairy as well as the basal ones, on edge long flagellated.

The sprigs of raceme are lateral (Fig.2).

Bracts are leaf-like. Flower pedicels 1-2 mm long, at the fruit elongate and droop down, simple hairy.

Calyx is 5-7 mm long, sepals elliptic, two of them slightly bigger, rounded at the top, sparsely adherently simple hairy, at the edge adherently flagellated.

Corolla is pale pink. Corolla disc is 12-15 mm wide, bell-like, lobes are rounded, nude, in the opening with furfuraceous, small, white warty appendages.

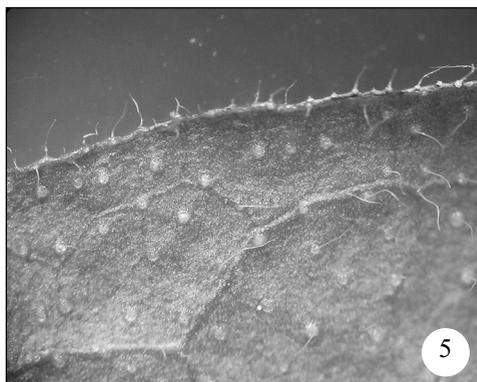
Nutlets are 7-10 mm in diameter, rounded, protruding, with thick, varying, unevenly distributed, prickly, at top with stelliform spikes (Fig. 3).

Flowering season is May-June and fruit-bears in June-August.

On our herbarium samples the monitored differences are: the upper side of the basal leaves is nude, shining (Fig. 4), the under surface is sparsely single simple hairy with upright pappus, have no adherent hairs, lying on albescent warts (Fig. 5). Probably in the process of herbarisation and pressing of plant, pappus become flatten against the leaf blade; corolla is darker, deeper pink with very light mauve tinge (Fig. 6).

V. Distribution of *Cynoglossum germanicum* Jacq. in Bulgaria

There is one location of the species reported so far in the floristic region of Central Balkans Mountain in particular in its part Shipchenska Planina Range at about 1000 m height. A herbarium material with flowers and fruits has been collected, coll. Y.Marinov.



Figs. 1-6. **1.** Plant in phase leaf rosette (autumn); **2.** General habitus of the plant with raceme (in June next year); **3.** Sprig with not ripen fruits (nutlets); **4.** Upper surface of a basal leaf; **5.** Under surface of a basal leaf; **6.** Flowers.

Investigated specimens

SOA 059276, 059277 – coll. 24.07.2006

SOM 163833 – coll. 24.07.2006

SOM 164406 – coll. 02.07.2007

The location is within the territory of Bulgarka Nature Park, the species is discovered in a new area, which is different from the pointed by Nejčev classic locality. GPS coordinates are: Area-1 Location (Central point): E 25° 19' 46,386", N 42° 47' 10,471", Area-2 Location (Central point):): E 25° 19' 37,886", N 42° 47' 05,056" (Fig. 7)

The plant species occurs on area consisting of two parts. The total area is 20 565,55 m² as the first plot is 1 737,84 m² and the second one is 18 827,71 m².

VI. Habitat

Cynoglossum germanicum Jacq. grows in mixed beech-hornbeam forests upon rendzic on limestone, at 960 m a.s.l. together with: *Corylus avellana* L.; *Daphne mezereum* L.; *Festuca drymeja* Mert.& Koch; *Festuca altissima* All.; *Melica uniflora* Retz.; *Allium ursinum* L.; *Galium odoratum* (L.) Scop.; *Geum urbanum* L.; *Circea lutetiana* L.; *Lamium garganicum* L.; *Helleborus odorus* Waldst.& Kit.; *Sanicula europaea* L.; *Geranium robertianum* L.; *Mycelis muralis* (L.) Dumort.; *Mercurialis perennis* L.; *Euphorbia amygd*

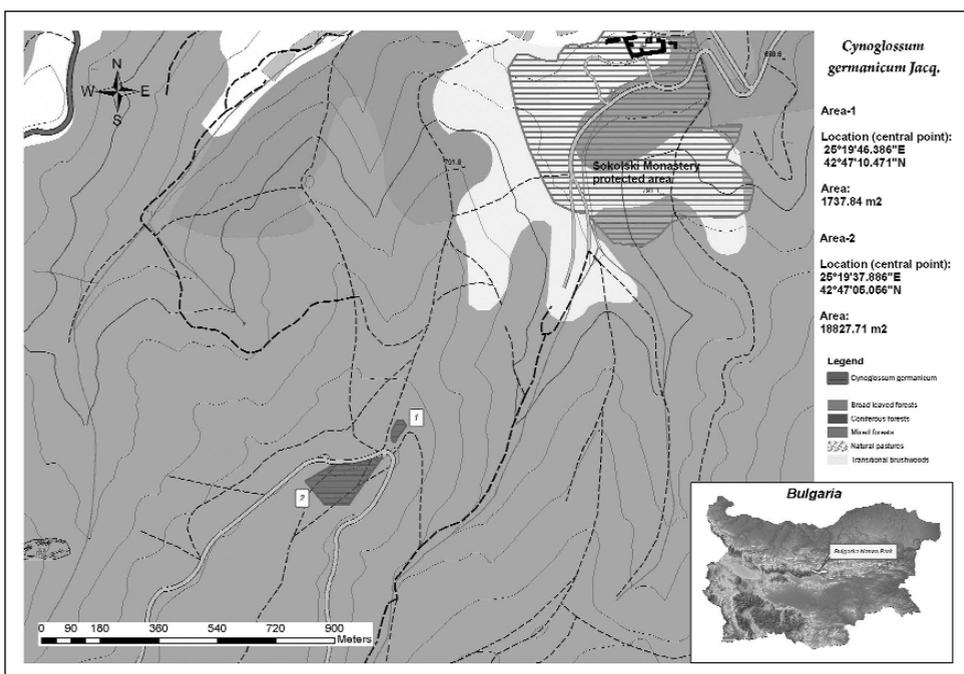


Fig. 7. Scheme of the species distribution in Bulgaria.

daloides L.; *Glechoma hederacea* L.; *Hedera helix* L.; *Viola reichenbachiana* Jord. ex Boreau ; *Orchis pinetorum* Boiss. et Kotschy ; *Listera ovata* (L.) R. Br., etc. The population holds great number of individuals. Plants are viable, with normal fruit-bearing and development of new seedlings.

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