

## **CRUCIATA GLABRA (L.) EHREND. (RUBIACEAE A. L. JUSS.) IN LITHUANIA: IN SITU AND EX SITU**

**Asta Klimiene, Kęstutis Kazimieras Vilkonis, Rimanta Vainorienė**

Klimiene A., Vilkonis K. K., Vainorienė R. 2010. *Cruciata glabra* (L.) Ehrend. (Rubiaceae A. L. Juss.) in Lithuania: *in situ* and *ex situ*. *Acta Biol. Univ. Daugavp.*, 10(1): 85 – 88.

There are more than 14 species in the genus of *Cruciata* Mill. In the country two species can be found and since 1976 one of them, *Cruciata glabra* L., is involved in the Red Data Book of Lithuania. Furthermore, this latter species is found only in two Baltic countries, namely Lithuania and Estonia. *Cruciata glabra* blows in May and June, grows in pinewoods, rarefied firwoods, bright leafy forests. This species grows in the bright areas only and if is grown in even slightly shadow it does not propagate and has just vegetative stems. The survival of this plant is also negatively affected by too great density of the forests. Two growth places in Lithuania are known and described. But since 2003 the third one is observed in Vainagiai (Ėiauliai district). This latter place is sparse, every year only 5 to 7 plants or propagated stems are found there. The purpose of this study is to describe natural growing place of *Cruciata glabra* (L.) Ehrend. and to evaluate adaptation of this plant in Botanical garden of Ėiauliai University. The plant is grown here since 2000 when transferred from growth place of Romainiai (Kaunas district). Till 2007 this plant was grown in the shady place, in almost neutral soil (pH 7.26). It propagated by the vegetative way only, blew not profusely. In the spring of 2007 *Cruciata glabra* was moved to the collection of rare plants in the Section of Plant Geography and Systematics. Here is sunny place, the soil is a little alkaline (pH 7.6). The plant adapted very well, blew profusely in May and June, procreated in vegetative way and nurtured seeds. Since 2007 information about *Cruciata glabra* growing in Botanical garden of Ėiauliai University is included in Index Seminum publication designed for international interchange of seeds.

Key words: *Cruciata glabra* (L.), *in situ*, *ex situ*, Red Data Book of Lithuania.

*Asta Klimiene, Kęstutis Kazimieras Vilkonis, Rimanta Vainorienė* Botanical garden of Šiauliai University, Paitaičių str. 4, LT-77156 Šiauliai, Lithuania. E-mail: dir@bs.su.lt

### **INTRODUCTION**

There are more than 14 species in the genus of *Cruciata* Mill. most of them grow to the south of Lithuania. Two species grow in Lithuania, namely *Cruciata glabra* (L.) Ehrend. and *Cruciata laevipes* Opiz. *Cruciata glabra* (L.) Ehrend. is frequent in Middle Europe, western and eastern districts of Mediterranean coast, area of Asia,

North America (Natkevičaitė-Ivanauskienė 1976). In the western part of East Europe also grow several isolated populations of this plant (Red Data Book of Lithuania 2007). It is pointed out in literature, that *Cruciata glabra* (L.) Ehrend. grows only in two Baltic countries and is very rare (Kuusk et al. 1996). Besides Lithuania, this species grows in Estonia (geobotanical districts no. 1a and 3b, Fig.1), but there it is very rare as

well. In Latvia it does not occur at the present time, but once in the beginning of 20 century it was found near Riga (Latvijas Daba 2007). In the herbarium of Tartu University the only specimen originates from the environs of Riga 1901 (Kuusk et al. 1996). In the older information sources of Lithuania it is said that this species is just for search (Snarskis 1954). Later it is mentioned that it was found already, but just in one place at geobotanical district no. 28c (Natkevičaitė-Ivanauskienė 1976), and the newest information sources say it grows (Fig. 1) in district 29c as well (Kuusk et al. 1996). It is noted in Red Data Book of Lithuania (2007) that one population of this species was found growing in pinewood (Romainiai growing place) and another population was found in leafy forest (Juodšiliai growing place). This species is included in the list of 3(R) category in Red Data Book of Lithuania (2007). So this very rare species and not numerous population is particularly endangered by spontaneous changes and economical use of forests. Now it is very important to keep favourable condition of growing places, particularly to maintain proper density of woods and bushes (Red Data Book of Lithuania 2007).

*Cruciata glabra* (L.) Ehrend. (*Rubiaceae* A. L. Juss.) is perennial plant with very thin, repent and branchy rootstock. The stem is 8-50 cm high (there are some of them), vertical or rising in the base, round, bare, sometimes the underpart is a little bit hairy, in the nodes is the circle of hairs. The leaves in the whorls are foursome, sometimes on the top of weaker stems they are threesome or even just pair. Leaves are elliptic, oblong, obtuse, 1,5 cm length and 5-7 mm width, the top side is bare with hairy edges and underpart along veins, three – veined, in the period of fructification they are unbended down (Natkevičaitė – Ivanauskienė 1976, Gudžinskas 1999, Vilkonis 2008). The blossoms are grouped by five into shorter than leaves and umbelliferous trusses without bracts. Corolla is green and yellow, its diameter is about 2 mm, lobules are elliptic, obtuse or shortly tapered. The blossoms are polygamous, into each umbelliferous truss usually all the lower blossoms are pistillate and the upper ones are

with stamens. The fruits are a little bit crooked, bare with smooth surface, has about 1.5 mm width and 2-2.5 mm length. *Cruciata glabra* (L.) Ehrend. in Lithuania blows in May and June, grows in pinewoods, rarefied firwoods, bright leafy forests. This species grows in the bright areas only and if is grown in even slightly shadow it does not propagate and has just vegetative stems (Natkevičaitė – Ivanauskienė 1976, Vilkonis 2008).

The purpose of this study is to describe natural growing place of *Cruciata glabra* (L.) Ehrend. and to evaluate adaptation of this plant in Botanical garden of Šiauliai University.

## MATERIAL AND METHODS

Natural growing place (*in situ*) of *Cruciata glabra* (L.) Ehrend. in Vainagiai forest (Kelmė district, Kurtuvėnai regional park) was observed and inventoried from 2003 to 2008. The growing place in Botanical garden of Šiauliai University (*ex situ*) was observed from 2000 to 2008. The gained data was used to evaluate condition and pervasion of *Cruciata glabra* (L.) population in natural growing place of Vainagiai forest, to evaluate condition and to collect seeds of this species growing in Botanical garden.

The soil pH of Botanical garden (Šiauliai University, Faculty of Natural Sciences) was measured with stationary meter Orion 410A.

## RESULTS AND DISCUSSION

*Cruciata glabra* (L.) Ehrend. (Fig. 2) was observed in 20<sup>th</sup> May 2003 in the 46<sup>th</sup> square of Vainagiai forest, Kurtuvėnai regional park (latitude N, longitude E). Later another three growing places of this species was found. All of them were quite rare, had 5 to 7 plants or propagated stems. These places were observed every year, and number of plants in population balanced from 4 to 10. The natural growing place is in bright pinewoods with some *Picea abies* (L.) H. Karst., *Betula pendula* Roth and

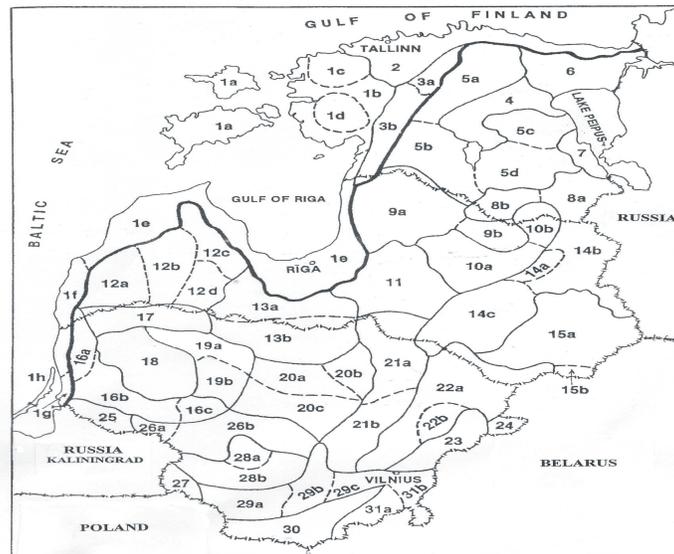


Fig. 1. Geobotanical districts

*Juniperus communis* L. The prevailing mosses are *Pleurozium schreberi* (Brid.) Mitt., *Ptilium crista-castrensis* (Hedw.) De Not., *Hylocomium splendens* (Hedw.) Schimp. and *Dicranum scoparium* Hedw., there also grow some *Calluna vulgaris* (L.) Hull., *Vaccinium vitis-idaea* L., *Festuca ovina* L., *Milium effusum* L., *Melampyrum pratense* L., *Helianthemum nummularium* (L.), *Pulsatilla pratensis* (L.) Mill. and *P. patens* (L.) Mill., *Chamerion angustifolium* (L.) Holub, *Scorzonera humilis* L., *Pyrola chlorantha* Sw., *Fragaria vesca* L. Next to the growing place on the dug up forest square line grow *Cerastium holosteoides* Fr., *Moehringia trinervia* (L.) Clairv., *Rumex acetosella* L., *Scleranthus annuus* L., *Spergula* sp. Mentioned place plant names from literature Z. Gudžinskas (1999). This growing place is the most northern natural place of this species in Lithuania. The 13 geobotanical district (Fig. 1) lies among Riga (1e) and Šiauliai (19 a). Possibility to find this species growing in brighter woods is very believable.

*Cruciata glabra* (L.) Ehrend. in Botanical garden of Šiauliai university is grown since 2000 when transferred from growth place of Romainiai (Kaunas district). Till 2007 this plant was grown

in the area of Lithuania Red Data Book plants under the lime (*Tilia cordata* Mill.) in the shady place, in almost neutral soil (pH 7.26). It propagated by the vegetative way only, blew not profusely. In the spring of 2007 *Cruciata glabra* (L.) was moved to the collection of rare plants in the Section of Plant Geography and Systematics. Here place is sunny, the soil is a little bit alkaline (pH 7.6). The plant adapted very well (Fig. 3), blew profusely in May and June, procreated in vegetative way and nurtured seeds. Since 2007 information about *Cruciata glabra* growing in Botanical garden of Šiauliai University is included in Index Seminum publication designed for international interchange of seeds.

## CONCLUSIONS

1. *Cruciata glabra* (L.) Ehrend. species is particularly endangered by anthropogenic influence and spontaneous changes of forests.
2. *Cruciata glabra* (L.) Ehrend. growing in sunny and bright area in the Botanical garden of Šiauliai University adapted very well, procreates in vegetative way and nurtures seeds.



Fig. 2. *Crucjata glabra* (L.) Ehrend. (Kurtuvėnai regional park, herbarium)



Fig. 3. *Crucjata glabra* (L.) in Botanical garden of Điauliai University (photo K. K. Vilkonis)

Latvijas Daba. 2007. <[http://www.latvijasdaba.lv/2/view\\_0\\_descr.asp?id=640](http://www.latvijasdaba.lv/2/view_0_descr.asp?id=640)>.

Lietuvos Raudonoji knyga (Red Data Book of Lithuania). 2007. Lietuvos Respublikos aplinkos ministerija, Vilnius: 485. (In Lithuanian).

Natkevičaitė – Ivanauskienė M. 1976. Lietuvos TSR flora (Flora of Lithuania SSR), 5: 190-212. (In Lithuanian).

Vilkonis K. K. 2008. Lietuvos žaliasis rūbas (Green coat of Lithuania). Kaunas: 228. (In Lithuanian).

Snarskis P. 1954. Vadovas Lietuvos TSR augalams pažinti (Guide to known plants of Lithuania SSR). Vilnius: 708-709. (In Lithuanian).

Received: 14.04.2009.

Accepted: 01.06.2009.

## REFERENCES

Gudžinskas Z. 1999. Lietuvos induočiai augalai (Vascular plants of Lithuania). Vilnius: 57. (In Lithuanian).

Kuusk V., Tabaka L., Jankevičienė R. 1996. Flora of the Baltic countries, 2: 259-268.