

## **GAGEA SPATHACEA (HAYNE) SALISB. (LILIACEAE) - A NEW SPECIES FOR THE FLORA OF SERBIA**

GORDANA TOMOVIĆ<sup>1</sup> and M. NIKETIĆ<sup>2</sup>

<sup>1</sup>*Institute of Botany and Jevremovac Botanical Garden, Faculty of Biology, University of Belgrade, 11000 Belgrade, Serbia and Montenegro;* <sup>2</sup>*Natural History Museum, 11000 Belgrade, Serbia and Montenegro*

**Abstract** - During field studies carried out in the territory of NW Serbia - the Pocerina region (Knić village) and surrounding of Valjevo (Divci village) in 2004, we collected some specimens of the genus *Gagea* and identified as *G. spathacea* (Hayne) Salisb. A review of the literature data revealed that this taxon has not been yet recorded for the flora of Serbia.

**Key words:** Serbian flora, Liliaceae, *Gagea spathacea*

UDC 58(479.11)

### INTRODUCTION

Here are the main features of *Gagea spathacea* (Hayne) Salisb., as followed by its description, ecology and inter-relationships.

Bulbous perennial plant, 15-20 (25) cm high. Bulbs 2, inequal, ovoid, 10-18 mm long, (5) 6-10 mm wide, in a subcoriaceous to coriaceous bright brown common tunic. Several small lateral bulbils also present outside the tunic. Stem erect, solitary, unbranched, leafy, glabrous. Two basal leaves, arise directly from the bulbs, usually longer than inflorescence or rarely equal, narrowly linear, fistular, glabrous, 15-20 (28) cm long, 1-1.5 mm wide; cauline leaf solitary, oblong-lanceolate, cucullate, glabrous. Two glabrous bracts; lower bract broadly lanceolate, spatulate  $\pm$  encompassing the stem, with 8-13 veins, 40-80 mm long, (3) 4-6 mm wide, slightly longer than inflorescence or almost equal; upper bract linear-lanceolate, with 3-5 veins, (10) 15-25 mm long, 1-2 mm wide, 3-17 mm above the lower bract. Flowers (1) 2-3 (5), apparently pedunculate in a variable sympodial umbel; pedicels 30-45 mm long, glabrous; bracteoles narrowly linear 2-15 mm long, glabrous, situated at the base of the pedicels or slightly above. Perianth of 6 free segments 10-13 (15) mm long, linear-lanceolate, obtuse, yellow inside and greenish-yellow outside with greenish margins. Stamens 6, inserted at the base of the perianth-segments, included; anthers basifixed. Fruit a loculicidal subglobose capsule with many subglobose seeds.  $2n=106$ . Flowering and fruiting IV-V.

*Gagea spathacea* is similar to *G. minima* (L.) Ker-Gawler (by its morphological features, both species belong to section *Minimae* (Pasch.) M. T. Davlianidze), but they differ in the number of basal leaves (two basal leaves in *G. spathacea*, one basal leaf in *G. minima*), in the shape of spatha and in fistular leaves of *G. spathacea*.

General distribution: *G. spathacea* is an endemic taxon in Europe (Tutin *et al.* 1980). It has a wide distribution range including Sweden, Belgium, Luxembourg, Denmark, Netherlands, France, Germany, Slovak Republic, Poland, Austria, Hungary, Italy (extinct in the wild), Slovenia, Croatia, Romania, and Russia (Baltic, Central and Southwest).

Distribution in Serbia: NW Serbia: the Pocerina region, Krnić village, (Gomilica Hill - UTM DQ03, *Rusco-Quercus-Carpinetum* (B. Jovanović, 1979), siliceous substrate, 100 m, leg. Niketić, M. and Tomović, G., 15-Apr-2004, 19271, BEOU, BEO) and surrounding of Valjevo, Divci village (Divci Hill - UTM DQ20, *Rusco aculeati-Quercetum frainetto-cerris* (Rudski, 1940; B. Jovanović, 1951; 1979), siliceous substrate, 250 m. (leg., Niketić, M. and Tomović, G., 04-Apr-2004, 19267, BEOU, BEO, 15-Apr-2004, 19284, BEOU, BEO). (Fig. 3.).

Ecology: According to the EUNIS classification (<http://eunis.eea.eu.int>) this species is mentioned in habitat definition as characterizing for Pannonic hygrophile ash-oak-hornbeam forests (EUNIS habitat type code



Fig. 1. *Gagea spathacea* (Hayne) Salisb. - herbarium sheet.

G1.A1B1). It also inhabits Pannonic woods with *Quercus petraea* and *Carpinus betulus* (NATURA habitat type code 91G0). According to literature data (Peterson *et al.* 2004), *G. spathacea* has very specific ecological requirements having in mind that strongly anthropogenically influenced sites are not colonized by this plant. This subatlantic plant species prefers Atlantic climatic conditions and is thereby relatively rare in the S Europe, while in N and C Europe, *G. spathacea* is more frequent.

This phytocoenological survey indicates that this plant inhabits lowland meso-thermophilous forests community *Rusco-Quercus-Carpinetum* (B. Jovanović, 1979), of the alliance *Carpinion betuli illyrico-moesiacum* Ht. 1956, as well as xerophile oak association *Rusco aculeati-Quercetum frainetto-cerris* (Rudski, 1940) B. Jovanović (1951) 1979 of the alliance *Quercion frainetto* Ht. 1954.

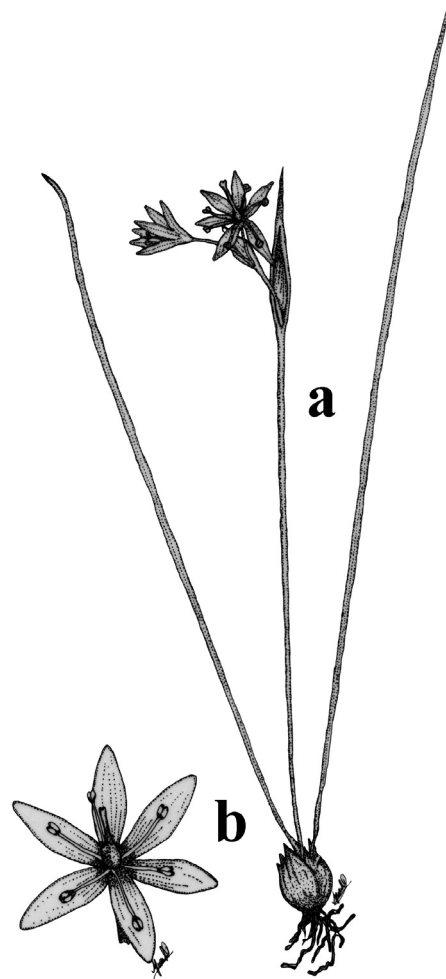


Fig. 2. *Gagea spathacea* (Hayne) Salisb. - a) habit; b) flower.

This plant grows at the altitude between 100 to 250 m, with E and S exposure and inclination between 5° to 10°. Geological substrate is siliceous and pedological substrate is characterized by light brown and brown forest soils. Detailed floristic characteristics of two stands are represented in several layers:

*Tree layer:* *Carpinus betulus* L., *Fraxinus ornus* L., *Quercus daleschampii* Ten., *Quercus cerris* L., *Quercus frainetto* Ten.

*Climbing layer:* *Hedera helix* L., *Tamus communis* L.

*Shrub layer:* *Acer campestre* L., *Acer tataricum* L., *Carpinus betulus* L., *Cornus mas* L., *Crataegus monogyna* Jacq. subsp. *azarella* (Griseb.) Franco, *Crataegus monogyna* Jacq. subsp. *monogyna*, *Euonymus euro-*

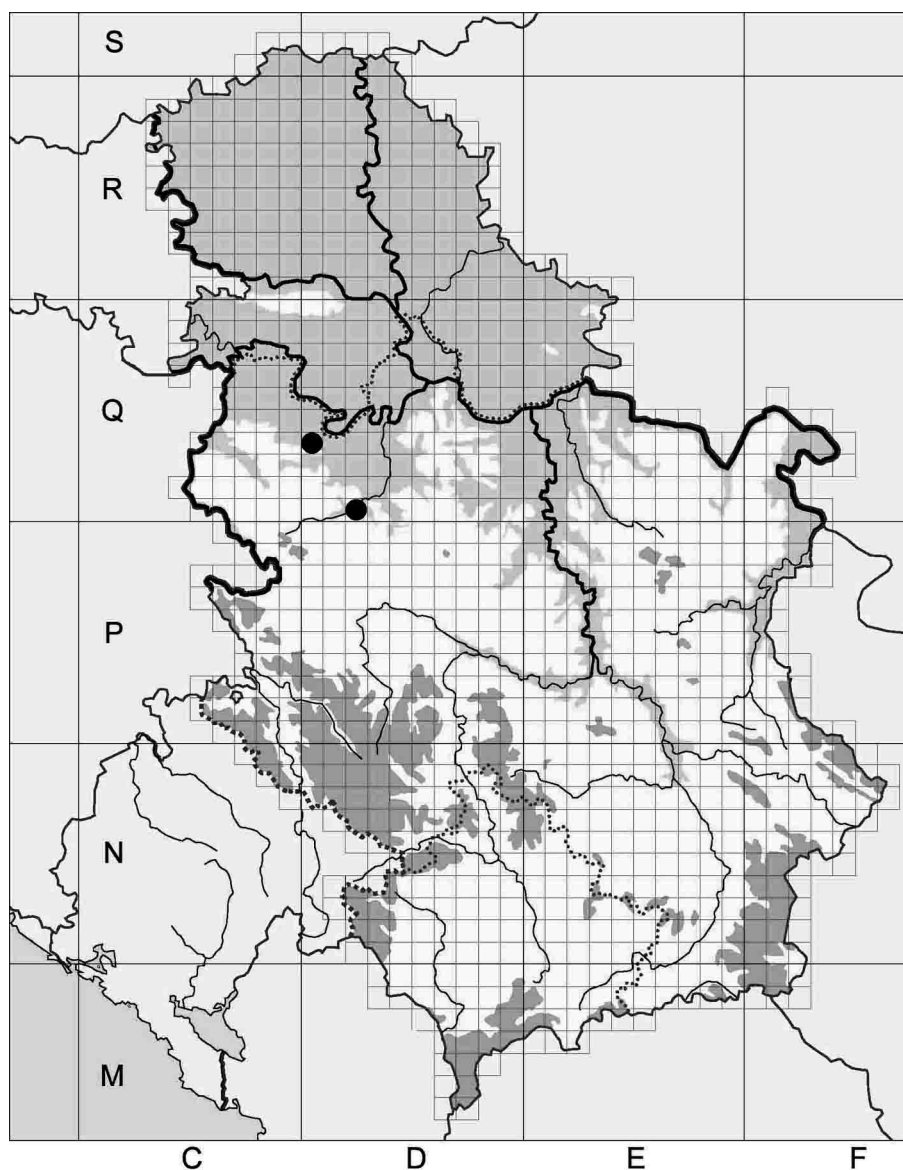


Fig. 3. Distribution of *Gagea spathacea* (Hayne) Salisb. in Serbia.

*paeus* L., *Fraxinus ornus* L., *Lembotropis nigricans* (L.) Griseb., *Ligustrum vulgare* L., *Lonicera caprifolium* L., *Prunus avium* L., *Prunus cerasifera* Ehrh., *Pyrus pyraeaster* Burgsd., *Quercus cerris* L., *Quercus daleschampii* Ten., *Quercus frainetto* Ten., *Rosa arvensis* Hudson, *Rubus hirtus* Waldst. and Kit., *Ruscus aculeatus* L., *Ruscus hypoglossum* L., *Sorbus domestica* L., *Sorbus torminalis* (L.) Crantz, *Tilia tomentosa* Moench, *Ulmus minor* Miller.

*Herb layer:* *Ajuga reptans* L., *Alliaria petiolata* (Bieb.) Cavara and Grande, *Allium ursinum* L., *Anemone*

*ranunculoides* L., *Asarum europaeum* L., *Cardamine bulbifera* (L.) Crantz, *Cardamine hirsuta* L., *Dactylis glomerata* L., *Erigeron annuus* (L.) Pers., *Festuca drymeja* Mert. and Koch, *Fragaria vesca* L., *Gagea lutea* (L.) Ker and Gawler, *Galium aparine* L., *Galium odoratum* (L.) Scop., *Geum urbanum* L., *Glechoma hirsuta* Waldst. and Kit., *Hedera helix* L., *Helleborus odoratus* Waldst. and Kit., *Lamium galeobdolon* (L.) Ehrend. and Polatschek, *Lamium purpureum* L., *Lathyrus venetus* (Miller) Wohlf., *Luzula forsteri* (Sm.) DC., *Melica altissima* L., *Poa bulbosa* L., *Poa pratensis* L., *Polygonatum odoratum* (Miller)

Druce, *Potentilla micrantha* Ramond ex DC., *Pulmonaria officinalis* L., *Ranunculus ficaria* L., *Rumex pulcher* L., *Scilla bifolia* L., *Stellaria media* (L.) Vill., *Taraxacum officinale* Weber, *Veronica chamaedrys* L., *Veronica hederifolia* L., *Vicia cracca* L.

### CONCLUSION

*G. spathacea* is found in Slovenia in subpannonian phytogeographical region (Martinič *et al.* 1999; Jogan, 2001) within the forest associations *Pseudostellario-Quercetum roboris* Aceto 1973, and *Pseudostellario-Carpinetum betuli* (Tomažić, 1939) Aceto 1973 (Aceto, 1973, 1986), and in Croatia, where this plant grows on hilly areas in a forest community *Quercus-Carpinetum illyricum* Ht. 1938 (Marković and Mikulić, 1989). Its occurrence in peripannonian region of Serbia is therefore not surprising, having in mind that it was also recorded in similar forest communities in northern Croatia. However, this finding in NW Serbia represents a new southeastern distribution limit of this species in the Balkan Peninsula. Considering the fact that this species belongs to early flowering and ephemeroïd geophytes, new findings in adequate habitats in Serbia are possible.

*Acknowledgements:* The authors are indebted to Mr. Rastko Ajtić for the illustration and to Mr. Miroslav Jovanović for its help in field investigation. The Ministry of Science and Environmental Protection of the Republic of Serbia, Grant 1505,

supported this research.

### REFERENCES

- Aceto, M. (1973). *Biol. Vestn.* **21**(2), 111-115.
- Aceto, M. (1986). *Biol. Vestn.* **34**(1), 125-126.
- Conti, F., Manzi, A., Pedrotti, F. (1997). Liste rossi regionali delle piante d'Italia, Camerino: Associazione Italiana per il World Wildlife Fund, Societa Botanica Italiana. - EUNIS (2005). European Nature Information System. Downloaded 01-Sep-2005. (<http://eunis.eea.eu.int>).
- Marković, Lj., Mikulić, S. (1989). *Acta Bot. Croat.* **48**, 169-172.
- Martinič, A., Wraber, T., Jogan, N., Ravnik, V., Podobnik, A., Turk, B., Vreš, B. (1999). Mala flora Slovenije, Ljubljana: Tehniška založba Slovenije.
- Peterson, A., John, H., Koch, E., Peterson, J. (2004). *Plant Syst. Evol.* **245**, 145-162.
- Jogan, N. (Ed.) (2001). Gradivo za Atlas flore Slovenije. Miklavž na Dravskem polju: Center za kartografijo favne in flore.
- Pignatti, S. (Ed.) (1982). Flora D'Italia, **Vol. 3**. Bologna: Edagricole.
- Săvulescu, T., Nyărădy, E. I. (Eds.) (1966). Flora Republicii Socialiste România, **Vol. XI**. Bucuresti, Editura Academiei Republicii Socialiste România.
- Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M., Webb, D. A. (Eds.) (1980). *Flora Europaea*, **Vol 5**. Cambridge, Cambridge University Press.

### **GAGEA SPATHACEA (HAYNE) SALISB. (LILIACEAE) - НОВА ВРСТА ЗА ФЛОРУ СРБИЈЕ**

ГОРДАНА ТОМОВИЋ<sup>1</sup> и М. НИКЕТИЋ<sup>2</sup>

<sup>1</sup>Институт за ботанику и Ботаничка башта "Јевремовац", Биолошки факултет, Универзитет у Београду,  
11000 Београд, Србија и Црна Гора;

<sup>2</sup>Природњачки музеј, 11000 Београд, Србија и Црна Гора

Током наших екстензивних и интензивних истраживања у Поцерини и Ваљевској Подгорини утврдили смо, на два локалитета, присуство врсте *Gagea spathacea* (Hayne) Salisb. (Liliaceae); уз

таксономска, фитогеографска и еколошка разматрања, истичемо да су анализирани локалитети првоутврђена станишта те врсте у Србији.