NAT. CROAT. | VOL. 19 | No 2 | 445–449 | ZAGREB | December 31, 2010

original scientific paper / izvorni znanstveni rad

(NON)EXISTENCE OF THE SPECIES *GLAUCIUM CORNICULATUM* (L.) RUDOLPH (*PAPAVERACEAE*) IN CROATIAN FLORA

SARA MAREKOVIĆ & RENATA ŠOŠTARIĆ

Department of Botany, Faculty of Science, University of Zagreb, Marulićev trg 20/2, HR-10000 Zagreb, Croatia (e-mail: sara@lipa.botanic.hr)

Mareković, S. & Šoštarić, R.: (Non)existence of the species *Glaucium corniculatum* (L.) Rudolph (*Papaveraceae*) in Croatian flora. Nat. Croat., Vol. 19, No. 2, 445–449, 2010, Zagreb.

The finding of *Glaucium corniculatum* seed in archaeobotanical samples from Roman times on Veli Brijun Island and Zaton near Zadar, initiated detailed study of its phytogeography in Croatia. The study showed that all recorded appearances of this species can be considered ephemeral and that the species came to Croatia many times during the history.

Key words: *Glaucium corniculatum,* Croatian flora, archaeobotany

Mareković, S. & Šoštarić, R.: (Ne)postojanje vrste *Glaucium corniculatum* (L.) Rudolph (*Papaveraceae*) u hrvatskoj flori. Nat. Croat., Vol. 19, No. 2, 445–449, 2010, Zagreb.

Pronalazak sjemenki vrste *Glaucium corniculatum* u arheološkim uzorcima iz rimskog doba s Velog Brijuna i Zatona kod Zadra potaknuo je detaljno istraživanje fitogeografije ove vrste u Hrvatskoj. Ono je pokazalo da se sva zabilježena pojavljivanja ove vrste mogu smatrati efemernim te da je vrsta na prostor Hrvatske pristizala više puta kroz povijest.

Ključne riječi: *Glaucium corniculatum,* flora Hrvatske, arheobotanika

INTRODUCTION

During archaeobotanical study on Veli Brijun Island (ŠOŠTARIĆ & KÜSTER, 2001) and Zaton near Zadar (KRAJAČIĆ, 2009), horned poppy (*Glaucium corniculatum*) seed was found in samples from Roman times (1st to 5th century AD). Since this species is included in the Flora Croatica database (NIKOLIĆ, 2010) and not in the Index Florae Croaticae (1994), we decided closely to investigate appearance of the species in Croatia.

The genus *Glaucium* (*Papavaraceae*) is represented with 3 species in European flora: *G. corniculatum* (L.) Rudolph, *G. flavum* Crantz and *G. leiocarpum* Boiss. (MOWAT, 1964). Two of them, *Glaucium flavum* and *Glaucium corniculatum* are members of the Croatian flora (NIKOLIĆ, 2010). Since *G. flavum* is a species characteristic of gravelly

coasts where it forms a very specific community *Euphorbio-Glaucietum flavi* (HORVATIĆ, 1963; TRINAJSTIĆ, 2008; TOPIĆ & VUKELIĆ, 2009), data concerning distribution of *G. corniculatuma* are very scarce.

G. corniculatum belongs to the circum-Mediterranean (FOURNIER, 1961), S Mediterranean (PIGNATTI, 1982) or more precisely to the Mediterranean – oriental – Pontic – Pannonian (MEUSEL *et al*., 1965) floral element. It is distributed from the Canary Islands, throughout S and SE Europe to Asia Minor, Caucasus and Central Asia including N Africa (MEUSEL *et al*., 1965, MOWAT, 1965; NIKOLIĆ, 1970; POTTIER-ALAPETITE, 1979). In SE Europe (including Hungary and Romania) it grows on sandy and stony habitats, uncultivated wasteland and as weed in cornfields (HEGI, 1909; HAYEK, 1924–1927; NIKOLIĆ, 1970; TRINAJSTIĆ, 1973; MICEVSKI, 1993; PETROVA *et al*., 1999; TIBOR, 2000; KIRÁLY, 2009). It inhabitats similar habitats, including railway lines, in Central and W Europe, but in the last few decades it disappeared from corn fields. Here *G. corniculatum* is not a native species, rather naturalised, adventive or occasionaly brought from S Europe (LAUBER & WAGNER, 1998; AICHELE & SCHWEGLER, 2000; OBERDORFER, 2001; FISCHER *et al*., 2008). In general, it grows on nutrient-rich soils, distinctly warm during summer (AICHELE & SCHWEGLER, 2000), and it is member of ruderal vegetation of class *Chenopodietea* s.l. (TRINAJSTIĆ, 1973).

RESULTS AND DISCUSSION

During a study of plant macrofossils from archaeological Roman localities from Veli Brijun Island (ŠOŠTARIĆ & KÜSTER, 2001) and Zaton near Zadar (KRAJAČIĆ, 2009) *G. corniculatum* seeds were found (Fig. 1). Both localities are on the Croatian Adriatic coast, where Romans built their busy harbours. The species was identified according to CAPPERS *et al*. (2006) and to the comparative carpological collection of the authors of this paper. The seed is well preserved, so the identification is reliable and certain.

Further research into the horned poppy's potential existence in Croatia included a survey of a large number of floristic papers (Acta botanica 1925-2009, Natura Croatica 1993-2009). Only SCHLOSSER & VUKOTINOVIĆ (1869), noted that *G. cornicu-*

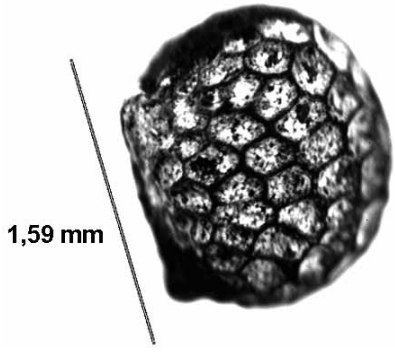

Fig. 1. *Glaucium corniculatum* seed from archaeological Roman locality from Zaton near Zadar.

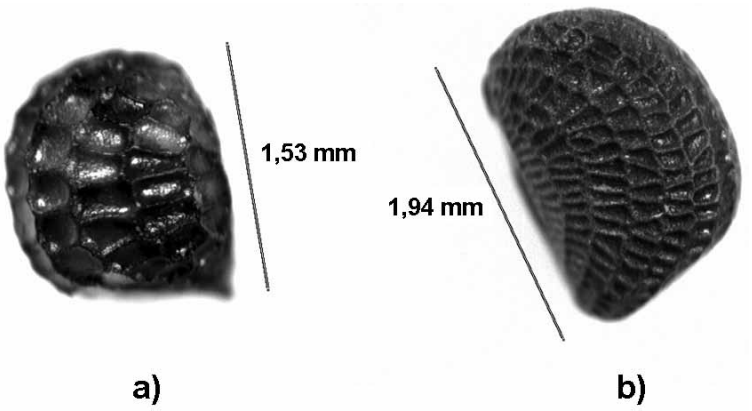

Fig. 2. *Glaucium corniculatum* (a) and *Glaucium flavum* (b) seed from comparative carpological collection of the Department of Botany, Faculty of Science, University of Zagreb.

latum was found in regions of Moslavina and Eastern Slavonia, as a cultivated, ornamental plant, and rarely in semi-natural habitats as pseudo spontaneous species. Their literature record for Moslavina is corroborated by a herbarium specimen the label of which claims that this species is rare in Moslavina region. Beside this herbarium sheet, there is another one from the Srijem region. The collector Striem did not specify if this locality refers to teh Croatian or Serbian part of Srijem, but considering the comments of HIRC (1909) it is quite obvious that this locality is in the Serbian part of Srijem.

Based on the all mentioned data, we conclude that *G. corniculatum* does not appear to be indigenous in Croatian flora. Although it was introduced several times throughout history, it has not succeeded to establish stabile populations.

Since the Croatian Adriatic is not a part of distribution area of *G. corniculatum*, we believe that the species occurred in archeobotanical samples as a random newcomer. In the Roman times, Eastern Adriatic towns were very important and busy transport, transit and trade centres, so it is most likely that the seed (and whole plants as well) came on some of the ships to the mentioned ports (GLUŠČEVIĆ *et al.*, 2006). SINNOTT (2007) states that *G. corniculatum* is also a native plant in North Africa and West Asia and in Roman times the trade between these regions and East Adriatic was very intensive. Being a potential seed contaminant, *Glaucium corniculatum* might have came from its native areas to our coast as an ingredient of cereals used as food for sailors or for trade. It is possible that the seed came to the Croatian coast in cereal cargo from continental Europe, although we believe that it is less probable scenario.

Diagnostic descriptions of seed

The seed of the *G. corniculatum* (Fig. 2b) is just 1.5 mm long and is mostly rounded. It also has a glossy and smooth alveolate surface, but the pits are mainly slightly rounded hexagons and pentagonals, with dimensions larger on average than those on *G. flavum* seed surface.

On the other hand, the seed of the Croatian indigenous species *G. flavum* (Fig. 2a) is about 2 mm long and although it varies in its shape, from rounded to reniform, the latter is more frequent. The seed has alveolate, faveolate surface with pits separated by thin ridged partitions. The pits are mostly quadrangular, rarely trigonous. The surface is glossy and smooth without any prickles or spines.

ACKNOWLEDGEMENTS

We wish to thank Vedran Šegota and Zorana Sedlar for their critical reading of the manuscript and for many useful suggestions. We are also grateful to Miško Plazibat for his help with herbarium study and Antun Alegro for useful field data and suggestions about the *Glaucium* species.

Received March 29, 2010

REFERENCES

AICHELE, D. & SCHWEGLER, H.-W., 2000: Die Blütenpflanzen Mitteleuropas 2. 2 Aufl. Franckh – Kosmos Verl., Stuttgart.

CAPPERS, R. T. J, BEKKER, R. M. & JANS, J. E. A., 2006: Digitale Zadenatlas van Nederland, 521.

FISCHER, M. A., OSWALD, K. & ADLER, W., 2008: Exkursionsflora für Österreich, Lichtenstein uns Südtirol. 3. Aufl. Biologiezentrum der Oberösterreichischen Landesmuseen, Linz.

FOURNIER, P., 1961: Les quatre flores de la France. Ed. Paul Lechevalier, Paris.

GLUŠČEVIĆ, S., JURIŠIĆ, M., ŠOŠTARIĆ, R. & VUJČIĆ KARLO, S., 2006: Evidence for the nutrition of sailors from the Roman harbour at Zaton near Zadar. Archaelogia maritima Mediterranea **3**, 147–161.

HAYEK, A., 1924–1927: Prodromus Florae peninsulae Balcanicae 1. Verlag des Repertoriums, Dahlem bei Berlin, 352–353.

HEGI, G., 1909: Flora von Mitteleuropa. J.F. Lechmanns Verlag, München.

HIRC, D., 1909: *Glaucium*, In HIRC, D., Revizija hrvatske flore (Revisio florae croaticae). Rad JAZU 181, 46-47.

HORVATIĆ, S., 1963: Vegetacijska karta otoka Paga s općim pregledom vegetacijskih jedinica Hrvatskog primorja. Prir. Istraž. Jugosl. Akad. 33, Acta Biol. 4.

KIRÁLY, G., 2009: Új magyar füvészkönyv. Magyarország hajtásos növényei. Határozókulcsok. Aggteleki Nemzeti Park Igazgatóság, Debrecen.

KRAJAČIĆ, M., 2009: Biljni makrofosili antičke luke u Zatonu kraj Nina. B. SC. Thesis, Faculty of Sciences, University of Zagreb.

LAUBER, K. & WAGNER, G., 1998: Flora Helvetica. P. Haupt. Verl., Bern – Stuttgart – Wien.

MICEVSKI, K., 1993: Flora na Republika Makedonija 1/2. Makedonska akademija na naukite i umetnostite, Skopje.

MOWAT, A. B., 1964: In TUTIN T. G., V. H. HEYWOOD, N. A. BURGES, D. H. VALENTINE, S. M. WALTERS & D. A. WEBB (eds.): Flora Europaea 1, Cambridge University Press, 241.

NIKOLIĆ, V., 1970: *Papaveraceae*. In JOSIFOVIĆ, M., Flora SR Srbije 2. Srpska akademija nauka i umetnosti. Odeljenje prirodno-matematičkih nauka, Beograd, p. 6–20.

NIKOLIĆ, T. (ed.), 2010: Flora Croatica Database. http://hirc.botanic.hr/fcd/.

OBERDORFER, E., 2001: Pflanzensoziologische Exkursionsflora für Deutschland und angrenzende Gebiete. 8. Aufl, Verl. E. Ulmer.

PAVLETIĆ, Z., 1994: Papaveraceae. In NIKOLIĆ T. (ed.): Index Florae Croaticae. Pars 1. Natura Croatica **3** (Suppl. 2.), 57.

PETROVA, A., ANČEV, M. & POLAMAREV, E., 1999: Kak da razpoznavame rastenijata v našata priroda. Ekskurzionen Opredelitel. Prosveta, Sofija.

PIGNATTI, S., 1982: Flora d'Italia 1. Edagricole, Bologna.

POTTIER-ALAPETIT, G., 1979: Flore de la Tunisie 1. Angiospermes – Dicotiledones. Apetales – Dialypetales. Publications Scientifiques Tunnisienes. Programme Flore et vegetation Tunnisienes, Tunnisie.

SCHLOSSER, J. C. K. & VUKOTINOVIĆ, LJ., 1869: Flora Croatica. Zagreb.

SINNOTT, Q., 2007: Germplasm Resources Information Network, http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?17622.

ŠOŠTARIĆ, R. & KÜSTER, H., 2001: Roman plant remains from Veli Brijun (island of Brioni), Croatia. Veget Hist Archaeobot **10**, 227–233.

TIBOR, S., 2000: A magyarországi edényes flóra határozója. Harasztok – virágos növények. Nemzeti tankönyvkiado, Budapest.

TRINAJSTIĆ, I., 1973: *Glaucium* L. In TRINAJSTIĆ, I.: Analitička flora Jugoslavije 1/2. Institut za botaniku Sveučilišta u Zagrebu, Zagreb. p. 384–386.

SAŽETAK

(Ne)postojanje vrste *Glaucium corniculatum* (L.) Rudolph (*Papaveraceae*) u hrvatskoj flori.

S. Mareković & R. Šoštarić

Glaucium corniculatum (L.) Rudolph je vrsta koja se ne pojavljuje autohtono na području Hrvatske, premda je uključena u bazu podataka »Flora Croatica database« kao član hrvatske flore. Vrsta se na našem području pojavljuje kao ukrasna biljka u vrtovima već preko 100 godina. Analiza antičkih paleobotaničkih nalaza potvrđuje postojanje sjemenki vrste *G. corniculatum* u nekim lukama (Zaton, Veli Brijuni) na području hrvatskog dijela Jadranskog mora. Kako su te luke u antičko vrijeme bila važna trgovačka i tranzitna središta, nalazak sjemenki daje naslutiti da su sjemenke transportom slučajno dospjele u ta područja, koja im po staništu i arealu ne odgovaraju.