

## ***Quercus banatus* grows in Slovenia**

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Kučera P. (2019): *Quercus banatus* grows in Slovenia. – Thaiszia – J. Bot. 29 (1): 061-069. – ISSN 1210-0420.

*Abstract:* Occurrence of *Quercus banatus* P. Kučera (= *Q. aurea* Wierzb., nom illeg.; *Q. dalechampii* auct. medioeur. non Ten.) was confirmed in Slovenia during a brief trip to Škocjan Caves in the Škocjan Caves Regional Park (southwestern Slovenia). The species is not recognized in the national Slovenian flora – *Mala flora Slovenije*, although it was recorded in the *Atlas Florae Europaeae* (under the name “*Q. dalechampii*”). *Q. banatus* individuals were recently found on two sites: on the slope of a natural bridge between collapse dolines Velika dolina and Mala dolina and on parking lot next to the Park’s Information Centre.

*Key words:* distribution, *Quercus*, *Quercus petraea* group, Škocjanske jame.

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### **Introduction**

*Quercus banatus* P. Kučera (= *Q. dalechampii* sensu auct. medioeur non Ten., see Discussion) is a tree species widely distributed in the Central Europe and Balkan Peninsula (cf. Fig. 1). Its northern distribution limit reaches more to the north according to newer studies, even to Poland (cf. Požgaj & Horváthová 1986; Koblížek 1993; Magic 2006); eastwards up to Caucasus (Magic 2006).

However, the newest edition of *Mala flora Slovenije* recognizes only 10 species of the genus *Quercus* growing in Slovenia, three of them (including *Q. frainetto* Ten.) as not native species (Martinčič 2007), and, *Q. petraea* group (= series *Sessiliflorae* sensu Schwarz 1936a) is there represented only by *Q. petraea* Liebl.

and there is no mention of two species of this group, *Q. polycarpa* Schur and *Q. dalechampii* Ten., accepted in both editions of *Flora Europaea* (Schwarz 1964, 2010).

Nevertheless, *Q. dalechampii* Ten. was recorded in Slovenia within the project *Atlas Florae Europaeae* (Jalas et al. 1976, map 298) with a locality in southwestern Slovenia, the other locality marked close to Sava river between Ljubljana and Zagreb might be from Slovenia as well. Aeschimann et al. (2004) indicate that distribution of this species in the Alpien region of Slovenia should be supplemented.

This contribution presents recent records of *Q. banatus* P. Kučera in Slovenia in the area of the Škocjan Caves Regional Park.

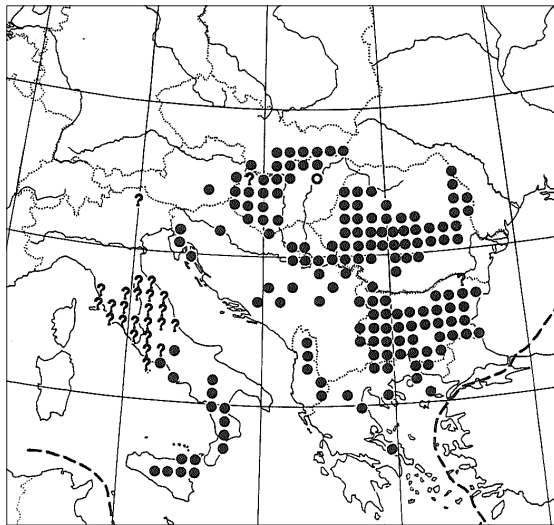


Fig. 1. Distribution of *Q. banatus* according to *Atlas Florae Europaeae* (Jalas et al. 1976, map 298).

## Methods

GPS coordinates were obtained by application GPS Status & Toolbox 8.4.177 installed on smartphone Redmi Note 3. Herbarium samples are deposited in the reference herbarium of Comenius University in Bratislava, Botanical Garden, workplace Blatnica (abbreviation BBZ, see Vozárová & Sutorý 2001). Outline map of Slovenia was provided by [www.worldatlas.com](http://www.worldatlas.com).

## Results

On 2<sup>nd</sup> September 2018, two sites of occurrence of *Q. banatus* P. Kučera were noted with collaboration of R. Rapant during a short trip to the Škocjan Caves (Škocjanske jame) in Škocjan Caves Regional Park lying in the southwestern part of Slovenia (Fig. 2).

The first noted locality (coordinates 45°39.9580' N, 13°59.4780' E, ± 10 m) is situated in the natural bridge between the collapse dolines Velika dolina and Mala dolina. Two young trees (Fig. 3) grow here directly at the left side of the tourist trail on the upper part of steep slope of the Velika dolina, somewhat below the splitting-up of the trail to the village of Škocjan and the Information Centre of the Škocjan Caves Regional Park.



Fig. 2. Localization of the noted occurrence of *Q. banatus* within Slovenia.

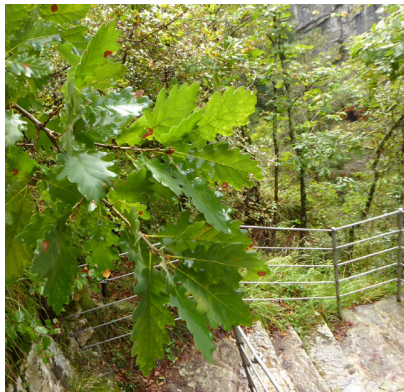


Fig. 3. *Q. banatus* branch of the individual in the collapse doline Velika dolina.

According to old leaves scattered along the trail towards the Information Centre it is possible that, apart of *Q. cerris* L., other oak individuals presumably related to *Q. banatus* P. Kučera occur in the mixed woodlands of the Škocjan Caves area; however, during our limited time for visit and further shortened by heavy rain any attention could be paid to closer study and documentation of the fallen

leaves and their possible maternal trees. Nevertheless, the found individuals should undoubtedly be of an autochthonous origin because the steep slopes of the Velika dolina are completely unsuitable for a land management, especially for forest plantations.

The second site of noted *Q. banatus* occurrence (coordinates 45°39.7590' N, 13°59.3140' E, ± 3 m) is the parking lot next to the Park's Information Centre. Two-stemmed older tree of low height grows in a line of trees dividing the lot into halves differing by their altitude. The individual is not the part of the recent plantation and it is clearly recognizable from a distance by yellowish green colour of its leaves.

Two trunks of this tree indicate that this occurrence might be a remnant of an older tree growing here before; however, it is not sure if the age of that supposed individual would be older than anthropic changes of circumjacent landscape connected with origination and development of the Information Centre of Škocjan Caves Regional Park.

In the direct surroundings of the parking lot and along the starting (above ground) part of the guided tour to the cave of the Reka river (from Information Centre to Globočak) only *Q. cerris* trees were seen, but is possible that *Q. banatus* could be growing there, especially when the species was found in the slope of the collapse doline Velika dolina.

## Discussion

Oak populations of *Q. banatus* have been known under the name *Q. dalechampii* Ten. in the previous literature sources (see below). The latter name has been applied to different taxa in the past which was comprehensively summarized by Di Pietro et al. (2012) – cf. Schwarz (1936a, b, 1937) vs. Camus (1935–1936, 1939). Di Pietro et al. (2012) solved the problem of an inconsistent application of the name *Q. dalechampii* Ten. by designating a lectotype which explicitly belongs to the pubescent oak type (group of *Q. pubescens* Willd.). After this decision, the name *Q. dalechampii* Ten. is no longer applicable for the Central European populations previously classified as *Q. dalechampii* Ten. as well as for the equivalent populations in the Southeastern Europe (cf. Beldie 1952, Gančev & Bondev 1966).

Therefore, Kučera (2018) proposed a name for *Q. dalechampii* sensu auct. medioeur. non Ten. – *Q. banatus* P. Kučera (bas. *Q. aurea* Wierzb. ex Kotschy; syn. *Q. aurea* Wierzb.), following Schwarz's (1936a) synonymization of "*Q. dalechampii* Ten." with *Q. aurea* Wierzb. (cf. also Schwarz 1937, Beldie 1952, Pignatti 1982; or Magic 2006).

However, it should be noted that careful examination of data referred to as "*Q. dalechampii*" (= sensu auct. non Ten.) is needed to ensure their adequate taxonomic determination, i.e. identification as either *Q. banatus* P. Kučera or other basic or hybrid/hybridogeneous taxon (within the *Q. petraea* group, or with a taxon from *Q. robur* group or the *Q. pubescens* group; see below).

The occurrence of *Q. banatus* (under the name "*Q. dalechampii* Ten."), is reported in floras from all countries surrounding Slovenia (general data for former Yugoslavia are omitted): Italy (Pignatti 1982), Austria (Adler et al. 1994, Aeschmann et al. 2004), Hungary (Simon 2000, Király et al. 2009–2011), Croatia (Nikolić et al. 2004), also in Serbia (Janković 1970, Kojić 2007). The taxon was included and extensively characterized in national floras of Romania and Bulgaria (Beldie 1952, Gančev & Bondev 1966) more than half a century ago, following the concept of Schwarz (1937) (cf. also recently Ančev 1992, Sanda et al. 2004, Oprea 2005, Asjov et al. 2012). *Q. dalechampii* Ten. was also recognized in the territories of Central Europe other than Romanian one (Soó 1964; Mátyás 1967, 1970; Stojko 1969; Futák 1972; Magic 1975; Chopyk et al. 1977) and incorporated in later national floras and handbooks (Soó 1970; Horváthová 1986; Ivčenko 1987; Ciocîrlan 1988; Dostál 1989, 1991; Koblížek 1990, 2002; Didux et al. 2004; Magic 2006; Sârbu et al. 2013, Chopyk & Fedoronchuk 2015).

I did not find any mentions of "*Q. dalechampii* Ten." in the botanical literature dealing with the region of the Škocjan Caves which would indicate presence of *Q. banatus* P. Kučera in this area. In total three oak species were recorded here till the present: *Q. cerris* L., *Q. pubescens* Willd. and *Q. petraea* Liebl. (Grom 1959, Slapnik et al. 2002), Dakskobler 2006, Debevec et al. c2013, Dakskobler et al. 2017; cf. also Zupančič 1999); Morton sec. Tomažič (1946) and Martinčič (1973, 2001) did not mention genus *Quercus* from the area. The online field guide of Debevec et al. (c2013) contains also photographic documentation of the recognized species. However, part of samples labelled as *Q. petraea* ssp. *petraea* (mostly from Italian territory) clearly belong to *Q. pubescens* group (incl. hybrid/hybridogeneous taxa) which indicates that knowledge on taxa of the *Q. petraea* group of the region of Škocjan Caves is insufficient and especially the data on the occurrence of *Q. petraea* s. str. from the other sources should be revised as well.

### Acknowledgements

I am very thankful to R. Rapant for his support and help in field, also to U. Šilc (Ljubljana), N. Rajčević (Belgrade), J. Kochjarová (Zvolen), J. Kliment (Blatnica), P. Meredá (Bratislava), G. Király (Sopron) and the workers of the Slovak National

Library (Martin) for help with literature sources. Preparation of this study was partially supported by Slovak grant agency VEGA, project No. 2/0119/19.

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Received: November 15<sup>th</sup> 2018

Revised: February 12<sup>th</sup> 2019

Accepted: February 20<sup>th</sup> 2019