



The Balkan Botanical Congress is an international meeting that has been held nearly every three years, since 1997. It brings together botanists from around the world who perform research on plants in the widest sense, as well as scientists who are engaged in the plant sciences and their applications. We were honored to host such an extraordinary scientific event this year in Serbia.

The 7th Balkan Botanical Congress – 7BBC 2018 took place in Novi Sad from September 10th to 14th 2018. The Congress was organized by the University of Novi Sad, Faculty of Sciences, Department of Biology and Ecology and the “Andreas Wolny” Botanical Society, along with the great help of 7 co-organizers and more than 30 supporters and sponsors. It truly was not possible to happen without exceptional help of our co-organizer - the Institute for Nature Conservation of Vojvodina Province who made this congress not only possible, but totally awesome.

7BBC 2018 placed a special emphasis on plants of the Balkan Peninsula and covered various research fields. The Congress was organized into ten sessions: Plant Anatomy and Physiology, Plant Taxonomy and Systematics, Plant Molecular Biology and Genetics, Floristics, Vegetation and Phytogeography, Conservation Botany and Plant Invasions, Phytochemistry and Plant Resources, Agronomy and Forestry, Botanical Collections and History, Ethnobotany and Cryptogam Biology. These topics were elaborated through five plenary lectures given by eminent scientists, as well as in the form of introductory lectures, oral and poster presentations. With an overall number of 387 abstracts presented on the very latest of botanical science, we shared knowledge, expertise and novel ideas. We welcomed nearly 400 scientists to Novi Sad, and we believe that we succeeded in our joint endeavor to make new networks and new connections among botanists. We hope that we contributed to advancements in the wide and beautiful field of botany, ranging from fundamental botanical research to applied botany.

It is our great pleasure to publish this Abstract Book in Botanica Serbica, in the same year that this international journal, a renamed continuation of the Bulletin of the Institute of Botany and Botanical Garden Belgrade, celebrates its 90 year jubilee. On behalf of the Scientific and Organizing committee of 7BBC 2018 we would like to express our gratitude to all contributors, colleagues and sponsors for taking part in the 7th Balkan Botanical Congress, as well as for their efforts and contributions to it's successful realization.

Goran Anačkov and Lana Zorić,  
Co-presidents of the Scientific Committee of the 7 BBC  
and guest editors of Botanica Serbica 42 (supplement 1).

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### Sessions:

**The 7th Balkan Botanical Congress consists of plenary lectures, introductory lectures of each session, as well as oral and poster presentations on the following topics:**

**Sessions 1.** Plant Anatomy and Physiology

**Sessions 2.** Plant Taxonomy and Systematics

**Sessions 3.** Plant Molecular Biology and Genetics

**Sessions 4.** Floristics, Vegetation and Phytogeography

**Sessions 5.** Conservation Botany and Plant Invasion

**Sessions 6.** Phytochemistry and Plant Resources

**Sessions 7.** Agronomy and Forestry

**Sessions 8.** Botanical Collections and History

**Sessions 9.** Ethnobotany

**Sessions 10.** Cryptogam Biology



an inner multilayered zone of cells with lignified walls and occasionally crystal druses inside.

**KEYWORDS:** *Prunus*, light microscopy, extrafloral nectaries

Poster presentation 16 01 11

### POLLEN MORPHOLOGY OF *MALABAILA AUREA* BOISS. (APIACEAE) - BALKAN ENDEMIC SPECIES

Marina P. Mačukanović-Jocić<sup>1</sup>, Danijela Stešević<sup>2</sup>,  
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*Malabaila aurea* Boiss. (Apiaceae) is Balkan endemic species distributed in Albania, Bulgaria, Greece, Montenegro, Macedonia, and Croatia, mostly growing on thermophilic and sunny habitats. Golden yellow flowers arranged in terminal compound umbels are frequently visited by insect pollinators. The pollen of *M. aurea*, collected from flowers at full flowering stage, has been examined by both, light microscopy and scanning electron microscopy (SEM) in order to contribute to taxonomic and melissopalynological research. For light microscopy the pollen grains were prepared according to the standard acetolysis method, mounted in glycerin jelly and observed with a Leica DM2000 microscope equipped with a digital camera (Leica DFC320) and Leica IM1000 software. For SEM study the pollen grains were observed using JEOL JSM-6390 LV electron microscope. Following palynomorphological features were examined: length of polar axis and equatorial diameter, size, shape, ornamentation, apertures, polarity, symmetry and exine thickness. The pollen grains of *M. aurea* are isopolar, radially symmetrical and at the interface between medium-sized and large. The ratio between the length of the polar axis ( $49.4 \pm 2.1 \mu\text{m}$ ) and the equatorial diameter ( $19.5 \pm 1.1 \mu\text{m}$ ) amounts  $2.5 \pm 0.2$  indicating prolate shape. The grains are equatorially constricted (bone-shaped) with obtuse polar caps, and in polar view they are triangular with interangular furrows. The grains are tricolporate with three straight sunken ectocolpi arranged regularly meridionally, of mean length  $28.5 \pm 2.2 \mu\text{m}$ , each with one endopore positioned in the indentations between the mesocolpial lobes. Mesocolpial width is  $9.9 \pm 1.6 \mu\text{m}$ . The sculpturing pattern is rugulate – microperforate. Exine is  $1.22 \pm 0.25 \mu\text{m}$  thick at the poles and twice as thick in equatorial region ( $2.59 \pm 0.49 \mu\text{m}$ ).

**KEYWORDS:** *Malabaila*, light microscopy, scanning electron microscopy, palynomorphology

Poster presentation 17 01 27

### QUALITY RELATED PERICARP ANATOMICAL CHARACTERISTICS OF PEPPER GENOTYPES

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Anatomical characteristics affect technological quality and use value of edible fruits. Pepper is one of the most important vegetable species due to its high nutritional value, as well as due to its multiple uses in human nutrition (like fresh consumption, cooking, pickling) and in industrial processing. Quality requirements and desirable traits depend on the final use of fruits. Anatomical characteristics of fruits of 12 pepper genotypes selected for different purposes (Amfora, Piquillo de Lodosa, Kurtovska kapija, Kalifornijsko čudo - California Wonder, Anita, Šorokšari, Novosađanka, 214/14, Zeleni rotund, HS-2, HS-6, Venčarka) were analyzed. Cross sections of ripe fruits were hand-made and analyzed using light microscopy. Observations and measurements of pericarp parameters were performed using Image Analyzing System MotiC. Pepper fruit pericarp was composed of one-layered epidermis, 1-5 layers of collenchyma, vascular bundles and well developed parenchyma, with huge vesicular cells adjacent to endocarp. Differences among the genotypes were recorded in quantitative anatomical parameters. The thickest pericarp was recorded in peppers grown for fresh consumption (Kapia and Bell peppers) and pickling (Tomato peppers). Mesocarp was the thickest and with most numerous cell layers in tomato peppers, which had less developed peripheral tissues and the smallest proportion of cuticle, exocarp, endocarp and collenchyma tissue. The thinnest pericarp had peppers grown for spices, which were also characterized by the higher percentage of peripheral tissues (cuticle, exocarp, and collenchyma), thicker endocarp and lower mesocarp thickness. Discriminant analysis of the anatomical characteristics of the fruits showed a clear separation of the groups of genotypes according to their usage, although none of the analyzed parameters contributed significantly to this discrimination. The findings confirmed that anatomical parameters had an important role in use value determination of pepper fruits.

**KEYWORDS:** pepper fruit, pericarp anatomy, mesocarp

Poster presentation 18 01 26

### NUTLET ANATOMY, MICROMORPHOLOGY AND RAMAN SPECTROSCOPY OF THREE MACEDONIAN *SALVIA* SPECIES

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*Salvia* L. (sage) is the largest genus of Lamiaceae family comprising nearly 1000 species of which 36 species is represented in Europe and 15 species in Macedonia. *Salvia amplexicaulis* Lam. is distributed in the Balkan Peninsula, *S. ringens* Sibth. & Sm. is distributed in Eastern part of the Balkan Peninsula, while *S. jurisicii* is endemic species of the central part of the Republic of Macedonia. Mericarps (nutlets) of *Salvia amplexicaulis*, *S. jurisicii* and *S. ringens* were collected during fruiting phase in several localities in Macedonia and subjected to microscopical analyses for the first time. The objective of this study was structural, micromorphological and spectroscopic investigation of nutlets and mucilage of the mentioned *Salvia* species. Light microscopy (LM) and scanning electron microscopy (SEM) were employed in order to examine nutlets and mucilage morphology, as well as nutlets micromorphology and anatomy, while Raman and Attenuated Total Reflectance Fourier Transform Infrared (ATR FT-IR) spectroscopy were applied to obtain data on their chemical composition. The nutlets of *S. amplexicaulis* are the smallest ones and of prolate-spheroidal shape, while in *S. jurisicii* and *S. ringens* the shape is spherical. The largest nutlets are those of *S. ringens* (3.08 mm in length and 2.27 mm in width). Nutlets were pale to dark brown colored. Abscission scar was triangular in *S. amplexicaulis* and round in other two species. Trichomes were absent and surface ornamentation was reticulate in all examined species. Myxocarpy was obtained after 15 minutes of wetting in *S. amplexicaulis* and *S. jurisicii*, while larger nutlets of *S. ringens* produced mucilage after 45 minutes. Pericarp cross sections of all examined *Salvia* species showed considerable uniformity from anatomical point of view. Mucilage in all studied species was yellowish and transparent containing fibrils, except in *S. ringens*. The analysis of spectra obtained by Raman spectroscopy revealed that the nutlets are predominantly composed of  $\alpha$ -linolenic and linoleic acids. The results from ATR FT-IR spectroscopy showed that mucilages primarily consisted of polysaccharides. In conclusion, these findings provide contribution to the knowledge on the genus *Salvia* which could be useful in taxonomical investigation of this genus.

**KEYWORDS:** *Salvia*, nutlets, mucilage, micromorphology, microscopy, spectroscopy

Poster presentation 19 01 14

### CARPOLOGICAL INVESTIGATIONS ON SOME *CARDUEAE* SPECIES (ASTERACEAE) FROM TURKEY

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The tribe *Cardueae* comprises more or less 500 taxa included 39 genera in Turkey, according to recent reports. In the present study, cypselas morphological and anatomical structures of six representative species, two of them are endemic to Turkey, belonging to six genera were characterized in detail by using stereomicroscope and light microscope. The species were evaluated comparatively in the aspect of carpological variations and their anatomies were presented in here for the first time, except for *Xeranthemum annuum*. Morphological features including size, shape and color of cypselas were examined. Cypselas colors differ from dark brown-blackish to stramineous. Their shapes changes are oblong, oblong-cylindrical, widely oblong and narrowly oblong. The smallest cypselas occurred in *X. annuum*, the biggest one was found in *Echinops orientalis*, and the widest fruit was detected in *Arctium platylepis* among the investigated taxa. From anatomical observations, pericarp anatomical structures were described, as well as the structure of testa. It was determined that *Arctium platylepis* has parenchymatic pericarp structure, while *Psephellus hypoleucus* has sclerenchymatic one. On the other hand, both parenchymatic and sclerenchymatic cells were observed in *Xeranthemum annuum*. Two layers of endosperm were determined in *Echinops orientalis*, differently from other species. Tetragonal crystals were observed in three species (*Arctium platylepis*, *Onopordum turcicum* and *Psephellus hypoleucus*). Data obtained from this study were compared with the data present in literature. These results demonstrate that the compared fruit morphological and anatomical characters among species are significantly different and can be used as taxonomic markers in their classifications.

**KEYWORDS:** *Cardueae*, cypselas, anatomy, Turkey