

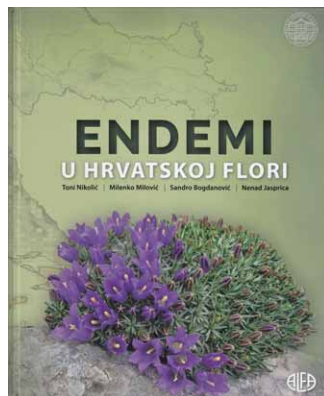
## BOOK REVIEW

*Endemi u Hrvatskoj flori* by Toni Nikolić, Milenko Milović, Sandro Bogdanović and Nenad Jasprica. 2015, 492 pp. ISBN 978-953-297-763-9. Publisher: Alfa d.d., Zagreb, Print: Grafika Markulin

It is believed that the first who used the term *endemism* in botany was DE CANDOLLE in 1820. Although the term was already used in medicine, where *endemic* referred to a disease occurring with high frequency in a defined geographical area, but not necessarily limited to it (GARBARİ 1990), DE CANDOLLE (1820) gave it a slightly different meaning, i.e. to designate a species growing exclusively in a defined area (SILJAK-YAKOVLEV and PERUZZI 2012). DE CANDOLLE (1875) recognized that endemic taxa are not just randomly distributed, while range restrictions indicating survival in refugia have been regarded as a driving force in the generation of distributional patterns of endemics. A relationship of areas of high endemism with presumed refugia has been well documented worldwide, especially for the Mediterranean basin (MÉDAIL and DIADEMA 2009); in Croatia alone, three glacial refugia have been registered: the Istrian peninsula, the Velebit and Biokovo mountains.

The present book has taken a step further, trying to thoroughly present and elucidate the phenomenon of Adriatic endemism on a much larger geographical scale, dealing with taxa of limited distribution ranges occurring also or exclusively in Croatia. The book has 492 pages divided into the following chapters: *Introduction*, *Endemic taxa in Croatia*, two *Appendices* and 13 *Boxes*. The text is accompanied by no less than 615 numerated pictures and more than 800 quality photographs (contributed by the authors and colleagues) and 200 hand drawings (most frequently redrawn with permission from ŠILJAK'S excellent book *Endemične biljke* (1984)) and an extensive bibliography for each taxon. The book is a joint effort of four authors: Toni Nikolić (TN), Milenko Milović (MM), Sandro Bogdanović (SB) and Nenad Jasprica (NJ).

In the *Introduction* the author (TN) sets the scene by explaining some basic terms linked to the flora of Croatia, the current state of knowledge on systematics and distribution of vascular plants in Croatia, and phenomena of endemism on both a global and a local scale including definitions on the categorization of endemics with some justifications of the criteria applied. However, it is exactly the classification of endemic taxa according to selected, well-accepted criteria (e.g. ecology, age, distribution range) that is one of the most controversial and intriguing issues in biology but the present book offers a purely technical and somewhat unusual proposal. For example: a taxon is termed "stenoendemic" if it is restricted to a narrow range completely within the borders of Croatia occupying up to approximately 4000 km<sup>2</sup> (e.g., in an alphabetical order: *Allium croaticum*, *A. telmateum*, *Asplenium hybridum*, *Campanula fenestrellata* s.l. etc.). However, while in certain cases even more



narrowly distributed taxa that occur in Croatia as well as in other areas (e.g. *Moehringia tommasinii*, the distribution range of which spans Italy, Slovenia and Croatia), are classified as “endemic”. Nevertheless, according to the given criteria and biogeographic analyses, authors thoroughly and in painstaking detail have described 155 (40%) endemic taxa out of 384 (7.6% of the total floristic inventory of the country) occurring in Croatia, while 53 (14%) taxa are mentioned in less detail. Due to the lack of information, 102 taxa were not taken into consideration. The extensive database, which was a basis for spatial analyses of endemism in Croatia, enabled some interesting insights into the spatial distribution of endemism. For example: the areas with the highest number of *stenoendemics* per unit area in Croatia are Kvarner, Velebit, the Krka river estuary with the Šibenik archipelago, Adriatic islands in central and southern Dalmatia, Mt. Biokovo and Konavle, while for *endemics* the most important areas are Gorski kotar, Mts Mosor, Kozjak and Učka, Čićarija, Kapela, Mt Lička Plješevica and Plitvice lakes, Mts Dinara and Omiška Dinara, the Žumberak and Samoborsko gorje hills, Mt Medvednica, Strahinščica, Ivanščica and the hills near Požega. The next 438 pages of the chapter *Endemi u hrvatskoj flori* are pure gold. Each genus with its subordinate taxa are thoroughly described, covering the Name of a taxon, Place of publication, and Common names in six languages: Croatian, English, Italian, German, French and Slovenian. Then follow: Species description, Distribution, Habitat preferences and ecology, Threats, Additional information and Literature. In 13 boxes authors give additional information on important contributors to the knowledge of Croatian flora, e.g. Muzio Tommasini, August von Hayek, Čedomil Šilić, Vinczé von Borbas and Paul Kitaibel, to name just a few. Although the selection of the presented taxa did follow a certain logic and defined criteria, it is, however, not clear why the authors did not present in detail some remarkable taxa such as: *Campanula austroadriatica*, *C. marchesettii*, *C. pyramidalis*, *Carlina fiumensis*, *Cerinth glabra* subsp. *smithiae* and subsp. *velebitica*, *C. tristis*, *Inula verbas-cifolia* subsp. *metanea*, *Onosma visiani* subsp. *biokovoense*, *Peucedanum crassifolium*, *Satureja montana* subsp. *variegata*, *S. subspicata* subsp. *liburnica* and subsp. *subspicata*, *Scabiosa silenifolia*, *Saxifraga prenja*, *Trinia carniolica* (*longipes*), etc., instead of taxonomically (T) and/or chorologically (CH; not according to selection criteria) “dubious” *Anthyllis montana* subsp. *atropurpurea* (T, CH), *Aquilegia dinarica* (CH – its occurrence in Croatia is doubtful), *Armeria canescens* subsp. *dalmatica* (T), *Asperula wetsteinii* (CH – its occurrence in Croatia is doubtful), *Cardamine chelidonia* (CH), *Trifolium dalmaticum* (CH) etc. With the exception of *Puccinellia teyberi*, there are no other representatives of grasses (Poaceae). An extensive literature list at the end of the description of each taxon is more than satisfactory, although in certain cases one gets the impression that the new insights into the systematics and taxonomics, although cited, are somewhat neglected or only partially accepted, e.g. in the case of *Brassica incana* agg., *Onosma echioides* agg., *Dianthus sylvestris* agg., and the genera *Cerinth* and *Centaurea*.

At the very end of the book, in the first Appendix, authors give us a complete list of endemic taxa of vascular plants in Croatia, while the second appendix in fact represents Index of Latin names of vascular plants.

This book is supposed to be a textbook for students attending the course *Flora of Croatia* at the University of Zagreb, but it will be valuable source of information to any nature explorer, and a must for any botanist interested in the biodiversity and biogeography of vascular plants of the Balkans. It will also serve as a promoter and conservation source

of vascular plants, as well as a sound grounding for further scientific activities in the area. All in all, the book, which has significantly raised the standard for future similar publications even on the international market, makes an impression on the reader and one must give all due credit to the authors for a great effort – an example to be followed. The book layout is fabulous and the print is spotless. Well, well done.

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