



RADOJEVIĆ, LJ. 2016. Biotechnology in Horticulture. Trees I. – Belgrade: AGM knjiga, Institute for Biological Research “Siniša Stanković”. 259 pp.; hardcover. ISBN 978-86-86363-65-7 (AGMK). [RADOJEVIĆ, LJ. 2016. Biotehnologija u hortikulturi: Drveće 1. – Beograd: AGM knjiga, Institut za biološka istraživanja “Siniša Stanković”. 259 str.] (In Serbian)

The monograph “Biotechnology in Horticulture, Trees I” by Prof. Dr. Ljiljana Radojević was reviewed prior to publication by two renowned academics, Dr. Radmila Vujičić, Full Professor at Belgrade University’s Faculty of Biology and Principal Research Fellow at the same university’s Institute for Multidisciplinary Research (retired); and Dr. Branka Gološin, Full Professor at the Faculty of Agriculture, University of Novi Sad.

The author, Prof. Dr. Ljiljana Radojević, Principal Research Fellow at the Institute for Biological Research “Siniša Stanković” (IBISS) and Full Professor at Belgrade University’s Faculty of Biology (retired), is an internationally reputed Serbian academic who pursued her career at the IBISS working on the establishment and development of protocols for *in vitro* regeneration of a number of plant species. Dr. Radojević was the first to obtain her MS and PhD degrees in plant *in vitro* culture at the Department of Plant Physiology, Faculty of Biology, University of Belgrade, and later became a lecturer in the same field. She began her work in the field of propagation of woody plants, which was then at its very beginning, and over time she achieved remarkable results that built for her a worldwide reputation and resulted in collaboration with numerous European (France, Belgium, Spain) and non-European (Chile, Ceylon) laboratories. She published a number of papers dealing with propagation of *Aesculus hippocastanum* L., *Paulownia tomentosa* Steud., *Corylus avellana* L., *Acer negundo* L., *Pinus nigra* L., *Populus tremula* L. and other species, via somatic embryogenesis and androgenesis.

The monograph **Trees I** is the first of three volumes of the “Biotechnology in Horticulture” series. It is 259 pages in length and contains 8 illustrations, 11 schemes, 8 tables, 81 figures and corresponding references. This book is mainly intended for graduate students in the fields of biology, forestry and agriculture, as well as for researchers



working on micropropagation and planting of woody species, but can also be of interest to a wider audience.

In vitro plant culture is a popular technique for micropropagation of important woody plant species with potential application in horticulture, a method that presents great opportunities compared to classical ways of tree propagation in greenhouses and nurseries. This book contains three chapters describing in detail application of different methods and techniques of *in vitro* woody plant culture. These chapters are preceded by a general introduction that in a popular way acquaints the reader with trees, starting with legends and moving on through historical records, artistic modeling, therapeutic properties of trees, development of woody species through geological

ages, preservation in xylotheques and the strategy of forestry development in Serbia. The book also presents a functional scheme of the Laboratory for *in Vitro* Tissue Culture at the IBISS, as well as a description of successful collaboration with experts from similar laboratories at institutes and faculties of agriculture in France, Spain, Belgium, Chile and Sri Lanka.

The first chapter of the book can be considered as a preface to the following two, given that it covers the theoretical basis of plant cell, tissue and organ culture *in vitro*, emphasising the induction of organogenesis, androgenesis and somatic embryogenesis in woody plant culture. Different methods are presented for the cryopreservation of 'micro' shoots of superior clones and somatic embryos with the aim of preserving the planting material in order to establish clonal orchards. Use of somatic embryogenesis in the production of synthetic seeds of tree species and secondary metabolites (SMs) of forest trees is explained in detail, in addition to which SM production in *in vitro* tissue culture and the biological function of SMs with medical applications are discussed. Also described here is the genetic transformation of trees and introduction of specific genes with the aim of improving horticultural woody species, which is one of the leading issues of future research in the field of plant biotechnology.

The second and the third chapters are concerned with the induction of somatic embryogenesis and formation of a number of regenerants in two prominent species, European hazel (*Corylus avellana* L.) and princess tree (*Paulownia tomentosa* Steud.). Hazel is an extremely important plant species because of its fruits, which represent high-quality

food for human nutrition. Paulownia is a fast growing tree, often referred to as an 'oxygen factory'. This species is suitable for planting clonal orchards in polluted areas and for the construction of field-protective belts against soil erosion. *In vitro* regeneration of woody species is known to be difficult and accompanied by numerous problems. Significant progress in this area has been achieved only in the last fifteen years. A virtue of this monograph is that it incorporates results on the micropropagation of these two very important woody species, emphasising their practical application. Regeneration of these woody species has been achieved through somatic embryogenesis, which represents one of the most efficient and productive procedures for clonal propagation of plant material. The protocols presented here were developed by the author herself and represent a good starting point for further research, as well as for practical application of the results, i.e., for the establishment of hazel and *Paulownia* orchards. Tree farming on plantations presents a solution to the considerable modern problem stemming from the high demand for wood and wood products on the one hand, and from the need to preserve forests on the other. In connection with some of the greatest problems of today's world, i.e., climate change, rapid population growth and the increasing need for a food supply, the book by Prof. Dr. Ljiljana Radojević can be said to be highly relevant, and I strongly recommend it to the readership of *Botanica Serbica*, as well as to the wider scientific community.

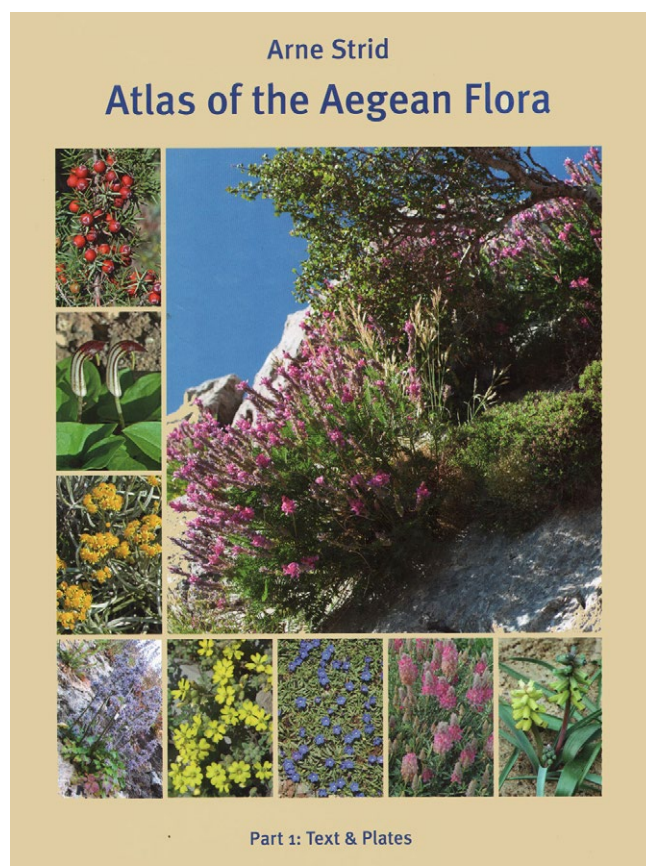
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STRID A. 2016. Atlas of the Aegean Flora. Part 1: Text & Plates, 700 pp. Part 2: Maps, 878 pp. – Englera 33 (part 1 & 2). Berlin: Botanic Garden and Botanical Museum Berlin, Freie Universität Berlin. Hardcover. ISBN 978-3-921800-97-3 (part 1); 978-3-921800-98-0 (part 2). Price: EUR 120 (both parts together) (In English)

This year, a prominent scientist and outstanding expert on the Greek and Balkan flora, Arne Strid, Professor Emeritus, enriched European botanical literature with another capital synthesis of floristic and phytogeographical surveys – the two-part *Atlas of the Aegean Flora* published by the Berlin Botanic Garden and Botanical Museum as Englera 33, Parts 1 (Text & Plates) and 2 (Maps). Either as author and editor or co-editor with Kit Tan, Professor Arne Strid has so far published major floristic works such as the two-part books *Mountain Flora of Greece* (1986 and 1991) and *Flora Hellenica* (1997 and 2003), so the magnitude of the renowned Swedish botanist's accomplishments is already fully recognised. Additionally, it should be mentioned that his rich scientific opus has been expanded by his and his wife Barbo's exceptional joint publishing achievement, the reissue of the collectable 10-volume edition of *Flora Graeca* by S. Sibthorp and S. Smith from the 19th century (1806-1840), which is now annotated and renamed *Flora Graeca Sibthorpiana*. This reprint consisted of five books with facsimiles of the original drawings, accompanied by up-to-date commentaries and maps of species distribution. Professor Strid is undoubtedly among the greatest and most prolific of European botanists, one standing shoulder to shoulder with famous predecessors who explored the flora of Greece and the Eastern Mediterranean (S. Sibthorp, E. Boissier, Th. Heldreich, E. Halacsy, D. Diampoulis, K. Rechinger, S. Runemark) and the leading contemporaries studying the Greek flora (W. Greuter, Kit Tan, D. Phitos, G. Kamari, S. Snogerup, P. Hatvig, T. Raus, N. Thurland and others).

The *Atlas of the Aegean Flora* represents in a way the culmination of Professor Strid's decades-long dedicated work and purposeful efforts not only to accumulate an immense herbarium collection, but also to review the plant specimens gathered around Greece and on the Aegean islands by numerous other botanists, and preserved in herbaria across Europe. In addition to this, the *Atlas* contains an extensive bibliography on the Greek flora listing references from which the various data in this book were drawn. It is of interest to know that Professor Strid also published the *Flora Hellenica Bibliography* in two books (1996 and 2006 editions) with a bibliographic database of 13,276 entries.

The first volume the *Atlas of the Aegean Flora* - Part 1: Text & Plates contains 700 pages and begins with an Introduction explaining the way in which chorological data regarding plant species were gathered and processed. This is followed by a map of the phytogeographical division of the territory of Greece and then by a collection



of maps covering the specific regions studied in the book: the Aegean islands (Thasos, Samothraki, the northern and southern Sporades, Evia, the Cyclades, Crete, Karpathos); the islands near the shores of Asia Minor (Lesbos, Chios, Samos, the Dodecanese, Rhodes); the Greek Aegean coast (the Halkidiki peninsula and Volos, East Attica, the eastern part of Argolis, the Malea peninsula on the Peloponnesus). Of particular importance is the map presenting the investigated Aegean region, where the recorded species of vascular plants are given in exact numbers for each island and for each Greek east Aegean coastal region. This map, summarising in a way the overall results of studies of the Aegean region conducted over the past two and a half centuries, offers a clear display of the exceptional richness of the Aegean flora, which accounts for more than a third of the estimated wealth of the Balkan flora.

The following 550 pages contain summarised but very informative and updated descriptions of 3,362 taxa (species and subspecies). The special value of the textual information in the *Atlas* Part 1 lies in the author's valuable comments regarding the taxonomic position and status of certain species, the validity of old data about the distribution of species whose presence in the Aegean region has not been confirmed or is questionable and the place occupied by certain taxa within the range of distribution of the genus or section to which a particular species belongs. Also, very useful keys are provided for each genus comprising more than two species. In addition, this review of the Aegean flora includes basic synonyms for taxa that have received different treatments in the taxonomic literature, and it is here that the author's critical approach to previously described taxa comes to the fore. All plant taxa are presented according to the new taxonomic classification set forth in *The vascular flora of Greece: an annotated checklist* (DIMOPOULOS *et al.* 2013). The *Atlas* Part 1 ends with 270 colour photographs of characteristic species of the Aegean flora and 16 landscape photographs, all arranged on 48 plates. It is noteworthy that the literature necessary to produce Part 1 includes over 1,000 references.

The special value of this two-volume monograph comes to full light in Part 2 (Maps) of the *Atlas of the Aegean Flora*: consisting of 878 pages, this is a proper kind of atlas that offers 3,362 maps covering the distribution of plant species and subspecies in the Aegean region and contains an index of their scientific names. These distribution maps apply to species that are found in the thermo-Mediterranean, meso-Mediterranean and supra-Mediterranean zones of the Aegean region. Not included in the maps or listed in the flora are species from the oro-Mediterranean and Cryo-oromediterranean zones of the Aegean region, which anyway are locally endemic and confined to the highest parts of Mount Athos and to mountains of the islands of Crete (Lefka Ori, Ida, Psiloritis) and Evia (Mt Dirfis). However, the respective distributions of most of these taxa appear in the author's two-part book *Mountain Flora of Greece*.

In Part 2 of the *Atlas*, each taxon is precisely mapped in high resolution and correspondent with the site's coordinates. Every map contains a commentary that includes a brief description of the habitat (substrate types, altitude range), flowering time, general distribution and information as to whether the taxon is endemic. This manner of providing chorological and environmental data unburdens the main text of Part 1 of the *Atlas* and supplies the reader with important information that is directly linked to the given map of distribution. In order to produce this type of atlas, it was necessary to gather and examine thousands of facts, an admirable enterprise which confirms the author's thoroughness and perseverance in arranging and presenting the data appropriately.

To put it briefly, the two-volume monograph *Atlas of the Aegean Flora* is more than a mere atlas of the distribution of a large number of taxa of the Aegean flora, although as such, by its very nature, it is already an impressive and important achievement in terms of chorology. More than that, what is offered here is a comprehensive presentation of the flora of the Aegean region comprising descriptions of taxa, keys for their verification and helpful remarks pertaining to a number of taxonomic, floral and chorological dilemmas regarding certain polymorphic species and aggregates. In this way, the reader of the monograph gets a complete insight into the richness and diversity of the vascular flora of this part of the Mediterranean. The content of the book takes in a significant part of the East-Mediterranean flora, which is characterised by great abundance, considerable diversity and a high level of endemism, especially on islands and in coastal areas of this Aegean region. Altogether, the *Atlas of the Aegean Flora* is an indispensable book which every botanist, particularly any researcher of the amazingly rich Mediterranean flora, should include in his library. More important, the *Atlas* should also be acquired by the libraries of botanical institutions and natural history museums. In a way, the *Atlas of the Aegean Flora*, by the wealth and exhaustiveness of information it contains, commends itself as a standard for similar botanical undertakings in the future.

Professor Arne Strid's remarkable contribution to the floristics, taxonomy and chorology of the flora of the Balkans, especially that of Greece, places him in the company of great and prolific botanists. This most recent major synthesis, together with his earlier books (*Mountain Flora of Greece* 1 & 2 and *Flora Hellenica* 1 & 2), leaves a permanent mark on botanical science of the Balkans and Europe in the second half of the 20th and beginning of the 21st centuries.

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