

## BOOK REVIEW

KELLY KINDSCHER, ED. FOREWORD BY STEVEN FOSTER. 2016. **Echinacea: Herbal Medicine with a Wild History.** (ISBN-13: 978-3-319-18155-4, hbk). Springer Customer Service Center, 233 Spring Street, New York, New York 10013, U.S.A. (**Orders:** www.springer.com, 1-800-SPRINGER). \$159.00 US, 238 pp., 16 b/w figs, 42 color photos, 16 tables, 6" × 9".

This book was a long time in the making, going back to Kelly Kindscher's undergraduate school days at the University of Kansas, but it was well worth the wait! His research on *Echinacea* is an extension of his "Great Plains love affair" and the plant species that are found in the grasslands and prairies, especially of Kansas and Nebraska. However, his collecting activities took him throughout the Midwest where *Echinacea* species are endemic and found nowhere else in the world. Steven Foster sets the stage for this book with his Foreword that places the reader in a historical perspective with the Lloyd brothers of Cincinnati, Ohio, who founded the world's largest library and museum devoted to medicinal plants in the early 1900s.

The Introduction is a personal account and overview of Kindscher's experience with *Echinacea*: why he studied the genus and why this book is unique. After the Introduction, the text is divided into Parts: Part I, Cultural Use; Part II, Botany; Part III, Wild Populations; Part IV, The Medicine and the Market; Part V, Conservation; Appendix A: Science in Action: A Model for Monitoring *Echinacea* Populations.

Sidebars (14) are intercalated in the main text, beginning with "Research on *Echinacea*" which personalizes Kindscher's interest in this plant as part of his graduate research at the University of Kansas in the mid-1980s. This added information enhances the text with more story-telling informal narrative that creates more interest and engages the reader. Sometimes there is humor injected, as in the hunt for a certain plant species that entailed a long walkabout that yielded nothing, but on return to the pickup, it was "right there" at Kindscher's feet that resulted in Sioux Tribal Elder Little Soldier (Alex Lunderman) joking about it (pp. 64, 65).

Native Americans used *Echinacea* as part of a "healing system" where the medicinal healing properties of the plant were part of a religious or spiritual "belief system." The Plains Tribes (19) had many uses of *Echinacea* as part of their herbal medicine repertoire, and Kindscher had first-hand experience living on-site at the Rosebud Sioux Indian Reservation in South Dakota, the Crow Reservation in Montana, and the Fort Peck Indian Reservation in Montana. His connection to place and people gives a special perspective as detailed in "The Uses of *Echinacea angustifolia* and Other *Echinacea* Species by Native Americans." Tables 1 and 2 list the tribes, areas, uses, plant part used, treatment, and references for three *Echinacea* species. Tables are not numbered consecutively but start over at one for each topical section. This topical section is the most detailed and comprehensive account of ethnobotanical uses of *Echinacea* species I have ever read.

The section "Cultivation of *Echinacea angustifolia* and *Echinacea purpurea*" provides advice for growing high quality cultivated commercial plants with desired chemical profiles. However, in general, wild plants have higher concentrations of chemicals that increase the value of these plants. Some of the plant properties that must be included to enhance tissue concentration of chemicals are: seed collecting, seed harvesting, germination rates, seed treatment, direct seeding, soils and transplanting, fertilization, and the effects on plant chemistry. Persons interested in growing *Echinacea* will find this chapter valuable reading.

Hardcore botanists will appreciate the "must read" Botany Section (pp. 37–80) that has topics about the "The Naming and Classification of *Echinacea* Species," "Taxonomic History and Recent Treatment and Issues," "The Biology and Ecology of *Echinacea* Species," and "Habitat." Other topical sections include: "A Species by Species Overview of *Echinacea*;" "Distinguishing Characteristics of *Echinacea* Species;" "The Species" with descriptions, black and white habit line drawings, and range maps (the most accurate to-date, showing counties in states where collections were made), and color photographic images are included for the following species (in order of their appearance in the text): *Echinacea angustifolia*, *E. pallida*, *E. purpurea*, *E. atrorubens*, *E. laevigata*, *E. paradoxa* var. *paradoxa*, *E. paradoxa* var. *neglecta*, *E. sanguinea*, *E. simulata*, and *E. tennesseensis*. This treatment of *Echinacea* species follows Professor Ronald L. McGregor's extensive study of the genus in the 1960s at the University of Kansas and the *Flora of North America North of Mexico* chapter by Lowell Urbatsch in 2005. There are no keys to the identification of species.

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"Wild Populations," Part III, highlighted by "One Hundred Twenty Years of *Echinacea angustifolia* Market Harvest in the Smoky Hills of Kansas," begins with the economic impact of *Echinacea* retail sales as the top-selling medicinal herb in the USA at approximately \$320 million in 1997. This source of income promoted "plant diggers" to harvest large quantities of roots, mostly of *Echinacea angustifolia* in western Kansas. Data compiled in Table 1, pp. 92, 93, records the price history of *Echinacea angustifolia* based on root diggings from 1855 to 2012, highlighting the boom and bust cycle of prices. One of the special attributes of this book is the first-hand accounts of *Echinacea angustifolia* harvests through direct person-to-person interviews with the "plant diggers" especially those located in Rooks County, Kansas.

The topical sections beginning with "Resilience of *Echinacea angustifolia* Plants" (pp. 96–103) and "Threats to Wild *Echinacea* Populations" (pp. 109–122) will give the reader a better perspective on overharvesting and the potential of root resprouting to repopulate areas. Information about sustainable harvesting practices is extremely valuable in this regard (see "Mitigation of Threats" and "Conservation Status," Table 1, pp. 120–121). However, this must be balanced against the gradual decline due to improper digging and constant overharvesting over time and the economic benefit to native peoples and the increased value of prairie habitat protection against habitat loss, preservation of biodiversity, and over-spraying pastures with herbicides. "The Future of Wild Harvest" and "Conclusion" (pp. 102–103) summarizes the risk-benefit analysis of root harvesting, and the following quote highlights these topical sections: "If restoration, stewardship, and responsible harvest techniques are practiced, the valuable cultural tradition of wild harvesting *Echinacea* can continue sustainably."

"The Medicine and the Market," Part IV, pp. 127–187, will require some knowledge of chemistry to fully understand, especially the "Chemical Constituents Isolated from *Echinacea* Species." Both the analysis and characterization of these chemical compounds would benefit from a course in organic chemistry or biochemistry. Furthermore, the qualitative and quantitative presence of chemical compounds in plant parts such as the roots, stems, leaves, and flowers may vary significantly as well as in the species of plant. Glycoproteins and polysaccharides are considered responsible for the immunostimulatory affects in the genus.

The efficacy of *Echinacea* preparations has been controversial for a long time due to the lack of controlled clinical studies. With this in mind, pp. 147–159 are required reading because these topical sections give a balanced overview of the experimental evidence for *Echinacea* as a herbal medicine. The thought-provoking "Conclusions and Suggestions for Further Study" ends with research questions that need further study.

"The *Echinacea* Market" begins with gross sales of *Echinacea* products that reached \$16.6 million in 2011 and ranked in the top ten of herbs sold. Table 2 is of special interest because it lists the *Echinacea* products on the market in 2013 tabulated by brand, species, plant part, and product type. There is much more information in these topical sections, but "The Media and *Echinacea* Sales and Use" highlights the importance and influence of scientific journals on whether *Echinacea* has significant value as a herbal medicine. The controversy still goes on!

Part V, Conservation, includes topical sections discussing the federal, state, and tribal laws that are enforced by the U.S. Fish and Wildlife Service and the U.S. Forest Service. Poaching or plant rustlers have decimated wild ginseng populations in Eastern U.S.A., leading to a list in Table 1 of States that have laws in 2013 relating to wild harvesting of native plants. Interestingly, the states of Kansas and Nebraska have no laws on the books, and Texas has protection of native plants. Only *Echinacea laevigata* is currently listed via the Federal Endangered Species Act; *Echinacea tennesseensis* was one of the first species listed in 1979, but was delisted in 2011, and this success story was due to the recovery efforts of scientists and conservation groups in Tennessee over the last 30 years. Some of this topical section includes "Recommendations Regarding the Conservation of *Echinacea* species," "Increase of Ecological Research," "*Echinacea* and the At-Risk List," and "Restoration and Conservation of Habitat."

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Appendix A: Science in Action: A Model for Monitoring *Echinacea* Populations" contains valuable resource information about sampling protocols for *Echinacea*. Table 8 is especially noteworthy because it has the vegetative composition of *Echinacea* populations in north-central Kansas.

Some general comments about the overall content of the book. No glossary is included, and this would have helped in defining *Echinacea* morphological terminology. References are cited in the text after each topical section instead of terminally. This has the advantage of quicker and easier association with narrative passages in the text. References are a blend of historical publications and many that are more recent. The text is carefully edited and free from typographical errors. There is an index to all sections in the book.

Unfortunately, Springer did not do justice to the content of this book or to the authors in the physical printing. The paper is not the highest quality matte paper; therefore, the color images are subdued and lack bright vivid colors. The book spine is glued (not Smyth sewn stitched) without heads and tails, and thus the book will not lie flat and pages flop back and forth. The front cover is hardback and not flexible and is more subject to damage, including the spine. It is sad that a book so beautifully written and with such valuable content is way overpriced and lacks the high print quality that should match the price.

Nevertheless, book content will be valued by botanists, conservationists, ecologists, environmentalists, foresters, gardeners, landscapers, commercial *Echinacea* growers, academicians/faculty teaching ethnobotany and taxonomy courses, and naturalists interested in grassland biodiversity. The genus *Echinacea* as described here could be used as a topical theme in university seminars and serve as a model of how medicinal wild plants can be harvested, sustained over time, and still provide economic income to native peoples who live below the poverty line.

This well-written narrative was a joy to read because the authors, especially Kelly Kindscher, prepared the text without overwhelming the reader with scientific jargon. There is a wealth of information in this book, and I highly recommend it to a readership with a broad spectrum of interests.—Harold W. Keller, PhD, Resident Research Associate, Botanical Research Institute of Texas, Fort Worth, Texas, U.S.A.

## BOOK LISTINGS: NEW ARRIVALS

MARK V. LOMOLINO, BRETT R. RIDDLE, & ROBERT J. WHITTAKER. 2017. **Biogeography. 5<sup>th</sup> Edition.** (ISBN-13: 978-1-60535-472-9, hbk). Sinauer Associates, Inc., P.O. Box 407, Sunderland, Massachusetts 01375, U.S.A. (**Orders:** www.sinauer.com). \$107.96 US, 759 pp., 462 illustr., 9" × 11.25".

BILL SCHEICK. 2017. **Adventures in Texas Gardening.** (ISBN-13: 978-1-62349-517-6, flexbound). Texas A&M Univ. Press, John H. Lindsey Building, Lewis St., 4354 TAMU, College Station, Texas 77843, U.S.A. (**Orders:** www.tamupress.com). \$26.00 US, 232 pp., 68 photos, bib, index, 6.25" × 9.5".

BILLIE L. TURNER. 2016. **The Comps of Mexico. A Systematic Account of the Family Asteraceae. Chapter 22 TRIBE MILLERIEAE Lindl.** (ISBN-13: 978-0-9981557-0-8, pbk; Phytologia Memoirs Vol. 26A). Texensis Publishing, P.O. Box 727, Gruver, Texas 79040, U.S.A. (**Orders:** www.phytologia.org). \$35.00 US, 85 b/w figures, 7" × 10".