

BOOK REVIEW

A Systematic Treatment of Fruit Types. By RICHARD W. SPJUT. 1994. *Memoirs of the New York Botanical Garden, Volume 70.* The New York Botanical Garden, Bronx, New York 10458. 181 pp., 53 figs., key to fruit types. Softcover, \$24.95. ISBN: 0-89327-383-X. [Order No. MEM 70. P & H \$3.50 + 5% of subtotal, for U.S. orders; \$4.50 + 6% of subtotal, for non-U.S. orders.]

Although published a little over two years ago, I only recently acquired a copy of this book and have found it to be an impressive reference—one which is clearly based upon an in-depth scholarly study and assessment of earlier carpological schemes and nomenclature, coupled with contemporary knowledge of the developmental morphology of fruits. Traditionally, the taxonomic schemes employed in vascular plants, especially at the generic and familial levels, have relied heavily on the morphology of flowers and fruits. For example, while the flowers of plants in the Rosaceae (the Rose family) are at a fundamental level quite similar, the differences in fruit types have resulted in the past recognition of such segregate families as the Malaceae (the Apple family, bearing pomes); and the Amygdalaceae (the Peach family, with "stone fruits"). However, while the botanical nomenclature employed for corollas and variations in floral structure has advanced considerably over the past 250 years, the nomenclature associated with fruit types and fruit morphology has remained largely vague and unstandardized. Critical to the advancement of knowledge in a given field is the standardization and definition of precise terminology (so that "we all know what we're talking about"), and the establishment of a taxonomic scheme that also allows for the growth of knowledge and, hence, allows for the standardization of new terms that conform to the established taxonomic structure, whether this is done by the assignment of new terms which conform to the old nomenclature, or the use of prefixes, suffixes, or enclitics appended to earlier terms.

Out of necessity for specific, unambiguous terms which could be used in the discussion and definition of fruit types ("...necessity is the mother of invention...."), Richard Spjut undertook a concerted study of the taxonomy and nomenclature used by botanists in earlier, seminal works, along with an assessment of their reliability, accuracy, and lack of ambiguity. The result is a beautifully prepared overview and—*much* more importantly—the establishment of a new systematic treatment for fruit types, one with a cohesive, comprehensive nomenclatural scheme which can be built upon if and when necessary.

In this work, Spjut has proposed several new names for fruits which have not previously had an appropriate and discrete term applied, or for types which have been known in the earlier literature by ambiguous *nomina confusa*. He has also proposed a new series, *Anthecocarpi*, for fruits not properly treated within other fruit types proposed earlier. This new series encompasses a diversity of grass genera, including *Aegilops*, *Agrostis*, *Cenchrus*, *Chloris*, *Eragrostis*, *Hordeum*, *Munroa*, and *Phalaris*. ...

I have often stated that a background in the classical languages (Latin and Greek) is profoundly important—if not indispensable—to students who want to pursue careers in the natural sciences (including the medical field). Such a knowledge of etymologies and morphemes will certainly be useful in referencing this treatment. As part of the taxonomy and nomenclature, distinctions are made between fruit types which are simple, derived from a schizocarpous gynoecium, or multiply derived. For example, a *bacca* (berry, L. 1751) is "an indehiscent pericarpium, or simple fruit, consisting of one or more seeds embedded in a solid fleshy mass supported by epicarp less than 2 mm thick, the pericarp not differentiated internally by a hardened endocarp or air-space" [e.g. *Solanum douglasii*]; a *baccarium* is "a fruit derived from a schizocarpous gynoecium consisting of fleshy-indehiscent fruitlets (monocarps) with a pericarp of a uniform texture and a determinate shape...." [e.g.

Anemopsis californica]; and a *baccetum* is "a multiple fruit consisting of fleshy-indehiscent carpels (apocarps) with an undifferentiated pericarp of a determinate shape...." [e.g. *Drimys winteri*].

This book is very nicely organized, with a brief but solid introduction; broad definition of the terms employed; extrapolation of philosophy; a key to the types of fruits; and a dictionary-like itemization of the "Accepted kinds of fruits" arranged in alphabetical order with their etymologies and definitions. The entries for specific terms include references to the originating author(s); nomenclature applied to types of fruit (with dates) which are considered synonymous with a more appropriate or unambiguous term; notes related to the term and its specific application; selected literature relating to the term or its concept; and selected vascular plant taxa whose fruits are considered "typical" of the concept and configuration under discussion. This work provides an extensive assortment of "literature cited," but also provides three appendices, the first two of which are particularly useful. Appendix A lists the genus (and family) names cited as examples in the text, along with the relevant fruit types discussed for those particular taxa; Appendix B lists the family (and genus) names (with the associated fruit types) mentioned or discussed in the text. Appendix C briefly indicates the abbreviations for the floristic literature cited.

This is certainly not a general reference for just anyone with a casual interest in botany or the types of fruits found on plants. However, I would consider it essential and indispensable to well-rounded botanists who, among other things, have a genuine interest in fruit types, their developmental morphology, and their classification.

In the RSA herbarium workroom, staff members and volunteers occasionally bring in bags of fruits from their yards to share with others who pass through the workroom. These often range from grapefruits to jujubes. Recently, however, someone brought in a bag of ripe pomegranate fruits to share. Not content to merely consume the fruits, the question raised among the herbarium employees was, "what type of fruit is a pomegranate?" While most individuals who have had an introductory course in botany can usually shout out "*hesperidium*!" when a tangerine is held up, or "*aggregate fruit*!" when a raspberry is displayed, we were all equally stymied as to *what exactly* a pomegranate fruit was.... That evening, I went home and looked it up in Spjut's treatment. The answer was—in relative terms—actually quite straight-forward. [Though I run the risk here of over-quoting in a book review, I think that the example presented gives a good idea of the level of information presented in this excellent reference book]:

"Balausta (Greek: pomegranate flower) Desvaux (1813). An indehiscent, anthocarpous fruit composed of a coriaceous exocarp (rind), a spongy endocarp, and sarcotestas (fleshy seed coats). Balausta (Balauste, Balaustia, Balaustídio, Balaustidium, Granafrucht) de Candolle (1819), A. Richard (1819), Lindley (1832), Schleiden (1849), Watzel (1852), Henfrey & Masters (1870, p.p.), Dugés (1882), Hertel (1959), Radford (1974), Takhtajan (1991). Typical—*Punica granatum* L.

Synonyms. *Baie* (Berry) Guibourt (1848), Judd (1985).

Notes. The balausta of *Punica* spp., derived from an inferior ovary, has characteristics of a pome and a hesperidium. The persistent calyx is reminiscent of the *Mespilus* pome whereas the texture of the endocarp is similar to the *Malus* pome. On the other hand, the membranous partitions, juicy seed vesicles, and the leathery exocarp are more like a hesperidium. In *Punica granatum*, the white-glossy endocarp is divided into a lower and upper region by a transverse diaphragm, and into numerous cavities bordered by spongy membranous layers of thin, white longitudinal dissepiments. *Punica protopunica* Balf. f., however, has only axile placentation (Cronquist, 1981). Therefore, the only distinguishing characteristic of the balausta would appear to be the sarcotestas. Fleshy-coated seeds also occur in *Cyclomorpha* (Caricaceae), a similar fruit that is derived from a superior ovary. Radford (1974) classified the balausta as a dry indehiscent fruit with a tough leathery pericarp, but the

pomegranate (*Punica granatum*), specifically associated with this name, is generally a fleshy fruit... (pp. 43–44)."

Overall, the number of typographical errors which I encountered in this work are exceedingly minimal. In no cases did I encounter "typos" which would lead to ambiguities—e.g., "*Hunulus* (Cannabaceae)" [p. 33, for *Humulus*]; and "Aetoxicaceae" [p. 93, for Aextoxicaceae]. The broad scope of this book invites the occasional "typo;" however, considering the wealth of information presented, this book is remarkably well edited.

Even though I am not a professor of botany, I believe that this work would make an excellent textbook for a graduate-level course on carpology. A student graduating with a Ph.D. in botany should—I believe—have gained a reasonable understanding of the range of morphological variation exhibited in plants, and not merely a working knowledge of the contemporary lab techniques that will help them to get a job. A certified "botanist" who is familiar with contemporary lab techniques but who doesn't know much of anything about the plants around them is—I think—a sorry excuse for a "botanist." As part of a compensatory routine of study, I believe that this book would be integral to the education of any such botanical misfit.

Along with its potential value to general students of botany, I'm sure that this treatment will also be of considerable use to palaeobotanists, who may often find themselves attempting to correlate unusual fossilized fruit structures with extant plant families or genera. In this respect, the key to fruit types, and the detailed discussions of which tissues are involved in the formation of the fruits, will be indispensable.

I consider this work to be an invaluable and seminal reference for vascular plant studies, and whole-heartedly recommend it to those who intend to spend their lifetimes studying the diversity and relationships of the plants that occur around them. This book is a rarity in that it constitutes a critically important botanical reference published in our generation.

— Timothy S. Ross, Herbarium (RSA), Rancho Santa Ana Botanic Garden, 1500 N. College Avenue, Claremont, CA 91711.



Ross, Timothy S . 1996. "A systematic treatment of fruit types, by Richard W. Spjut [Review]." *Crossosoma* 22(2), 95–97.

View This Item Online: <https://www.biodiversitylibrary.org/item/210978>

Permalink: <https://www.biodiversitylibrary.org/partpdf/370558>

Holding Institution

New York Botanical Garden, LuEsther T. Mertz Library

Sponsored by

BHL-SIL-FEDLINK

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Southern California Botanists

License: <http://creativecommons.org/licenses/by-nc-sa/4.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.