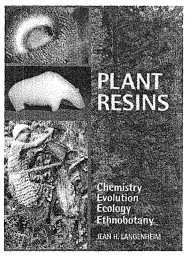
*Selbyana* 25(1): 173–177. 2004.

# BOOK REVIEWS




## PLANT RESINS: CHEMISTRY, EVOLUTION, ECOLOGY, AND ETHNOBOTANY

JEAN H. LANGENHEIM

2003. 612 p. $49.95. Hardcover. 47 color photos, 30 b/w photos, 70 line drawings, 4 maps, 4 tables. Timber Press, Portland, Cambridge. www.timberpress.com. ISBN 0-88192-574-8.

A number of sticky materials are produced by vascular plants. The various common names for such materials, such as resin, gum, mucilage, tar, latex, wax, oil, and turpentine, suffer the same complaints as most common names. The names are not used correctly in trade or everyday speech to accurately name a specific class of substances. These materials are often important and useful items in our economy; but of course, the plants did not expend their resources lavishly for our benefit. The molecules were selected through the process of evolution for some adaptive benefits to the plants. One obvious possibility would be to repel, entangle, poison, or otherwise thwart pests and diseases. Why, however, do some plants have these molecules, yet others do not? And why do some plant families produce latex, others resin, and still others gum? What other purposes do these materials serve in nature? Answers are not likely to be easy, but they are well worth seeking.

Jean Langenheim, in her text, *Plant Resins,* defines resins as "primarily a lipid-soluble mixture of volatile and nonvolatile terpenoid and/or phenolic secondary compounds that are 1) usually secreted in specialized structures located either internally or on the surface of the plant and 2) of potential significance in ecological interactions." Oddly, the glossary does not define "resin" at all. Dr. Langenheim reviews systematically, in a clear and useful way, the various resin-producing plants. Biochemists tend to focus upon molecular structures and properties. She gives us these, but goes much further, looking at the evolutionary and ecological results of resins along with the history and prehistory of the plants' relations with human life. These details make the book of great value in itself but also as a model for future botanical books on many other topics, including those other sticky materials produced by vascular plants. Which authors will now enlighten us on these other subjects?

Resins have past and present features. As they encounter other organisms, they interact with them and are acted upon in turn. In both the short and the long term, they change and cause changes. This one small corner of botany is actually a large and interesting area of study. For example, readers, when they find their curiosity aroused, will need to go beyond the book to the many references given.

Amber is a group of fossilized resins, of varied geographic and botanical origins. Langenheim has been interested in amber for many years. She gives us a wonderful array of information about it. Amber's role in the human discovery of electricity is surely its most important historical aspect. Homer spoke of amber glowing as if in sunshine. The Greek word "elektor" means "the sun's glare," and the ancient Greeks called amber, "elekton." Thales of Miletus, ca. 600 BC, studied the static electricity of rubbed amber. In the last two and a half centuries, human life has been transformed by the use of electromagnetism and electrons.

Page 178 of the book presents a startling photo of the excavation of the 68 kg boulder of Miocene amber in Sarawak. It is presumably solidified resin from the giant trees of the family Dipterocarpaceae. These trees, which dominate the Malesian forests, are the major source of hardwood plywoods used for household items that run on electricity. This leads us to the oil fields of Southeast Asia—Borneo, Sumatra, Myanmar, etc. Oil, today an essential energy source, came about by the geological transformation of enormous tonnages of Dipterocarp resin.

Resins possess many other unusual aspects. The naval stores industry in Florida and nearby states is well known to us in the southern United States. Ponderosa pines in the western states produce their own molecular variations of resin. The Abert squirrel feeds upon the young shoots of the pines, but some trees are effectively by-

passed as squirrel dinners. Adjacent trees can be severely defoliated and pruned by the rodents and, thus damaged, may be vulnerable to attack by pine beetles and fungi. The monoterpene molecules in the pine's phloem vary and thus control the pattern of edible and inedible shoots. This little ecological drama inspires many questions. The author suggests that the Abert squirrel and ponderosa pine could be of great value in our understanding of mammals and their selection effects upon plants. It is a very long time since I have camped out under the ponderosas. Reading the text and studying the attractive illustrations on page 208 made me want to pack my gear and head west.

With mammals being ever-popular "warm fuzzies," another interesting topic is the relation between post-glacial climates, birch forests, fires, and the population biologists' long-studied snowshoe hares. Shifting attention from the sub-Arctic to the tropics, we find a report of coaties grooming themselves and their friends with resin from *Trattinnickia* (a gumbo limbo ally). The Greeks and Romans had their own puzzling relationship with the now extinct plant *Zilphion* (or *Silphium*) of Cyrene, in the fennel alliance.

Classic civilization also made much use of propolis and allied materials. Honey bees prepare these from plant resins, bees' wax, and assorted odd ingredients such as dirt. The bee has long been, in many ways, as popular a human focus as are the larger mammals.

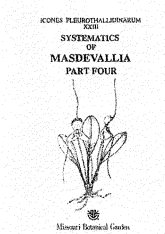
Sweet potatoes, our southern misnamed "yams," produce resins that not only suppress weeds but at least one species of moth. Several other ipomoeas show similar effects. Anyone seeking environmentally friendly gardening practices will want to study pages 418 to 420 and plan some experiments.

Because the lack of a fossil record for orchids is a longstanding issue known to many readers of *Selbyana,* I felt frustrated by the lack of details on pages 192 to 194, which reports on an orchid fruit found in Tertiary amber, either in Mexico or Hispaniola. The text is ambiguous as to the provenance.

Regarding the location of the Okefenokee Swamp, it is, for the most part, in Georgia. The book presents a few other minor quibbles, but they are few and far between in this large book, which has nearly 600 pages of text, many line drawings, and 47 excellent color photos. Space prevents mention of many other interesting topics. Don't sit down to read this fascinating book, unless you have time to do it justice.

*—John Beckner*
*Curator, Orchid Identification Center,*
*Research and Conservation Department,*
*Marie Selby Botanical Gardens,*
*811 South Palm Avenue,*
*Sarasota, Florida 34236-7726 USA*

---




## ICONES PLEUROTHALLIDINARUM XXIII—SYSTEMATICS OF *MASDEVALLIA* PART FOUR

CARLYLE A. LUER

2002. 1047 p. $60. Softback. One color plate, 146 black and white line drawings and 146 maps. *Monographs in Systematics Botany from the Missouri Botanical Garden.* Volume 87. Missouri Botanical Garden Press.

There are many classic works in the literature that orchid enthusiasts should consult at least once in their lives, if not have in their own book collections. I could mention John Lindley's *The Genera and Species of Orchidaceous Plants,* Heinrich Gustav Reichenbach's *Xenia Orchidaceae,* and João Barbosa Rodrigues's *Genera et species orchidearum novarum* (mostly in French, despite the title in Latin), just to name a few. Carlyle A. Luer's multi-volume work, *Icones Pleurothallidinarum,* no doubt belongs among these classic works. Currently in its 25th volume, this series has covered in detail perhaps the largest and one of the most interesting subtribes of Orchidaceae.

According to Robert A. Dressler, in his standard reference work *The Orchids, Natural History and Classification* (1981, reprinted in 1990, Harvard University Press), the Pleurothallidinae had "about 3800" species. Surely this number must have exceeded 4000 by now, and many more species are yet to be discovered. The

plants vary from minute in *Platystele* to hip-high in some terrestrial *Pleurothallis*; the flowers vary equally in size and morphology, and are pollinated mostly by flies and other two-winged insects, but birds and even moths pollinate at least some species. A diverse and fascinating group of orchids indeed.

The Systematics of *Masdevallia* series already has covered "approximately 100 species attributed to subgenus *Polyantha*" in Part One, "100 species in four sections of subgenus *Masdevallia* and the subgenus *Pygmaea*" in Part Two, "subsection Masdevallia and section *Minutae*" in Part Three, and now 100 additional species in subsections *Caudatae, Oscilantes,* and *Saltatrices* in subgenus and section *Masdevallia* in Part Four. Fifteen new species are also described, variously assigned to each of the parts. The eight new species belonging in parts 1–3 are described on specially numbered pages placed after the cumulative index of scientific names for parts 1–4. *Masdevallia barrowii* Luer, for example, is described and illustrated on pages 33a and 34a, meant to be ". . . inserted between pages 32 and 33." Additional replacement pages have been issued in the previous three parts but "most changes will not be printed until the final part."

Although little advertised, copies of Systematics of *Masdevallia* with unbound pages are currently available from the publisher. This feature is highly convenient when trying to identify a particular species, because separate drawings can be pulled out and compared, and later re-inserted. Of course, it also facilitates the addition of new pages. Growers who often find themselves trying to match one of their plants to different drawings may consider purchasing an unbound copy of the series.

The author provides keys for the species in each of the three subsections covered in Part Four, and each species is conveniently described so that the text and the distribution map is on one side of the page and the drawing on the other, as in the several *Icones* orchid publications currently available. The keys look complex, yet, how else can you write keys to the species of such a diverse genus? The text is clear and concise, the maps to the point, and the drawings of high diagnostic value, that is, all the parts needed to identify a particular species are carefully illustrated. The drawings are all sketched by the author, who also inked many of them, although most of the recent ones were skillfully inked by Stig Dalström (those that bear two sets of initials).

Botanical libraries and orchid enthusiasts should seriously consider Systematics of *Masdevallia* Part Four, and even the entire series. The latter is, however, a "must-have" for the serious *Masdevallia* grower.

*—Gustavo A. Romero-González,*
*Keeper, Orchid Herbarium of*
*Oakes Ames, Harvard University,*
*22 Divinity Avenue,*
*Cambridge, MA 02138 USA*

---


## ICONES PLEUROTHALLIDINARUM XXV: SYSTEMATICS OF *MASDEVALLIA* PART FIVE

CARLYLE A. LUER

2003. 279 p. $67.50. Softcover. Line art, distribution maps.
Missouri Botanical Garden Press.
ISBN 1930723199.

Systematics of *Masdevallia* Part Five marks the completion of Carl Luer's authoritative monograph of the popular orchid genus *Masdevallia.* This long-awaited work is the most recent of a series of *Masdevallia* monographs, which began with that by Florence Woodward in 1896. These earlier monographs have long been out of date because of the nearly exponential growth rate of the genus in the last few decades. Indeed, when Dr. Luer published the first volume of this series in 2000, he projected a four-volume work with about 400 species. In the following three years, however, so many new *Masdevallia* species were discovered that a fifth volume was deemed necessary.

Part of the explosion of new species is the result of publication of these very volumes, which make it relatively easy for botanists to identify existing species and hence to recognize new ones. Dr. Luer, aware that this trend is likely to continue, has incorporated numerous novel features in his series that make updates relatively

simple. The publisher even offers a loose-leaf version of these volumes, so that users can insert updated pages into proper sections.

As in previous volumes of this monograph, the species in Part Five are grouped by subgenera and sections. Part Five treats subgenus *Masdevallia* section *Masdevallia* subsection *Coccinae,* subgenus *Masdevallia* sections *Racemosae* and *Triotosiphon,* subgenus *Amanda,* and seven smaller subgenera. Keys are provided for the identification of all known species in each group, and each species is described and illustrated by excellent line drawings. As in previous monographs by Dr. Luer, the drawings capture so well the overall gestalt of each species that recognition is often instantaneous, without the need to refer to finer floral details. Along with the drawings and verbal descriptions, complete collection data, distribution maps, and historical notes also are provided for each species. In addition, newly discovered species in previously published groups are described and illustrated at the end of the volume.

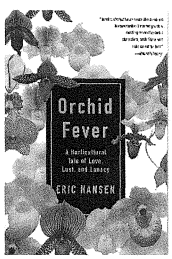
The infrageneric divisions used in this monograph are helpful and practical for identification purposes. A minor shortcoming is the difficulty of keeping track of the taxonomic hierarchy of subgenera and sections while paging through the species; a more consistent use of typefaces and heading styles at section boundaries would have helped this problem.

At the genus level, this volume incorporates some changes from other works. Dr. Luer reduces *Jostia teagueii* Luer back to *Masdevallia,* in agreement with DNA evidence presented by Alec Pridgeon and his colleagues. It also retains *Masdevallia bicornis* in the genus, contra Koniger but in line with well-supported DNA results and morphological arguments. The former *Masdevallia pelecaniceps* is not included here but in *Luerella,* again in line with DNA results. These are all reasonable assessments of the DNA and morphological data currently available, and unlikely to be controversial.

In general, Dr. Luer's monograph stands out from earlier ones because of his intimate knowledge of these species in the wild, and because of the broad perspective gained from his decades of study of the subtribe Pleurothallidinae (which includes *Masdevallia*). He understands the amount of variation normally encountered within a taxon, and the amount of lumping and splitting seems about right; it would be difficult to characterize him either as a lumper or a splitter here. This is a delicate tightrope to walk in such a horticulturally desirable genus, which traditionally has been more finely split than genera with small inconspicuous flowers. Dr. Luer does it very well, and Systematics of *Masdevallia* will quickly and justifiably become the new "bible" for all who study or grow these fascinating plants.

*—Lou Jost*
*South American Explorers,*
*Apdo 17-21-431, Eloy Alfaro,*
*Quito, Ecuador*

---




## ORCHID FEVER: A HORTICULTURAL TALE OF LOVE, LUST, AND LUNACY

ERIC HANSEN

2000. 272 p. $23. Hardback. Color dust jacket. Black-and-white line drawings. Pantheon Books.

For some folks, orchids are naughty flowers: flamboyant, outrageously perfumed, gaudily designed, whores of the botanical world. Their technical descriptions sometimes read like entries in a sexual anatomy text. Members of what is probably the largest family of flowering plants, orchids have long held the attention of our hearts, minds, and souls. Equal to their manifest extremes in form and function, the intrepid human caretakers of orchids—professional societies and research institutions, doctors and schoolteachers, politicians and housewives, and so many others—are often marked by a common lust and lunacy for these uncommonly beautiful flowers.

No middle-of-the-road historical fiction, Hansen's book documents some of this madness among contemporary orchid lovers. Sadly missing from his otherwise wonderfully engaging tale are interviews with more than just a handful of well-respected orchid taxonomists and research biologists. What is present, however, is

an unsettling story about schizophrenia among leading plant lovers and institutions: the objectivity of scientists versus the subjectivity of collectors; open debate and peer-review versus closed-door intrigue and manipulation; careful research and conservation versus shocking innuendo and exploitation. Hansen's book is the product of seven years of careful inquiry in some of the world's orchid Meccas to corroborate methodically this daunting personality disorder within the orchid community. He traveled from the roadways of northern Minnesota to the rain forests of Borneo, speaking with scores of individuals at orchid shows and botanical gardens to gain first-hand knowledge about these often diminutive plants and their human lovers "so utterly different in appearance from the orchids they judge."

Hansen also explains how this madness has contributed to the decline of orchid habitat worldwide. Ironically, part of the problem involved in their protection originates with the 1973 Convention on International Trade in Endangered Species, better known as CITES [sigh′-tees]. Headquartered in Geneva, this United Nations treaty is the very group designed to guide orchid conservationists in their duties of stewardship. Yet, "in the case of the rarest orchids on earth, not even a seed pod can be harvested and legally transported across international borders for commercial propagation." Despite more than 25 years of CITES conferences, resolutions, publications, raids, and costly reintroduction schemes, no reliable data exist to show unequivocally that CITES has "reduced smuggling, saved any orchid species from extinction, helped protect orchid habitats, or even salvaged orchid plants facing the certain destruction of their habitats." It seems a clear case in which blind adherence to an otherwise worthy international treaty ensures the extinction of some of the world's rarest species. It clearly is a case of legislative bias that favors animals, especially alluring megafauna such as whales and pandas, with plants too often cited as afterthoughts. Laws that work for animal protection do not necessarily work for plant conservation.

Hansen's book is a must-read for all orchidophiles, especially botanists, conservationists, ecologists, students, educators, and collectors. It is an informative text. Potentially, it is also a book that might help make over outmoded environmental legislation, transforming laws that regard plants only as the backdrop for animal protection to laws that regard plants as centerstage for life on earth. This volume could signal the beginning of a dialogue of reform among conservationists across the globe to focus on plants such as our seemingly garish orchids, not as expensive and pampered curios, but as principal components of an ancient living planet.

*—H. Bruce Rinker*
*Director of Environmental Education,*
*Center for Canopy Ecology*
*Marie Selby Botanical Gardens,*
*811 South Palm Avenue,*
*Sarasota, Florida 34236-7726 USA*