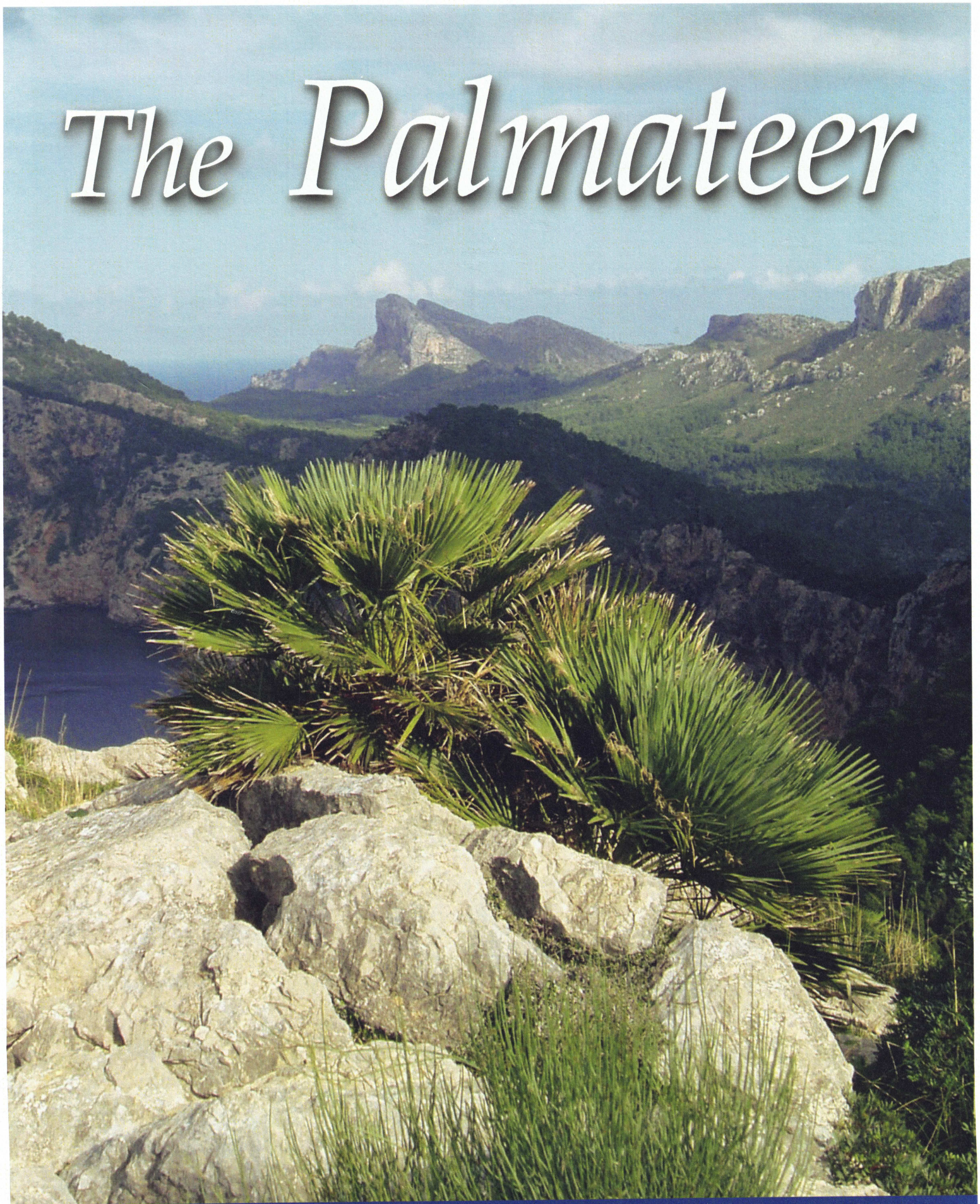
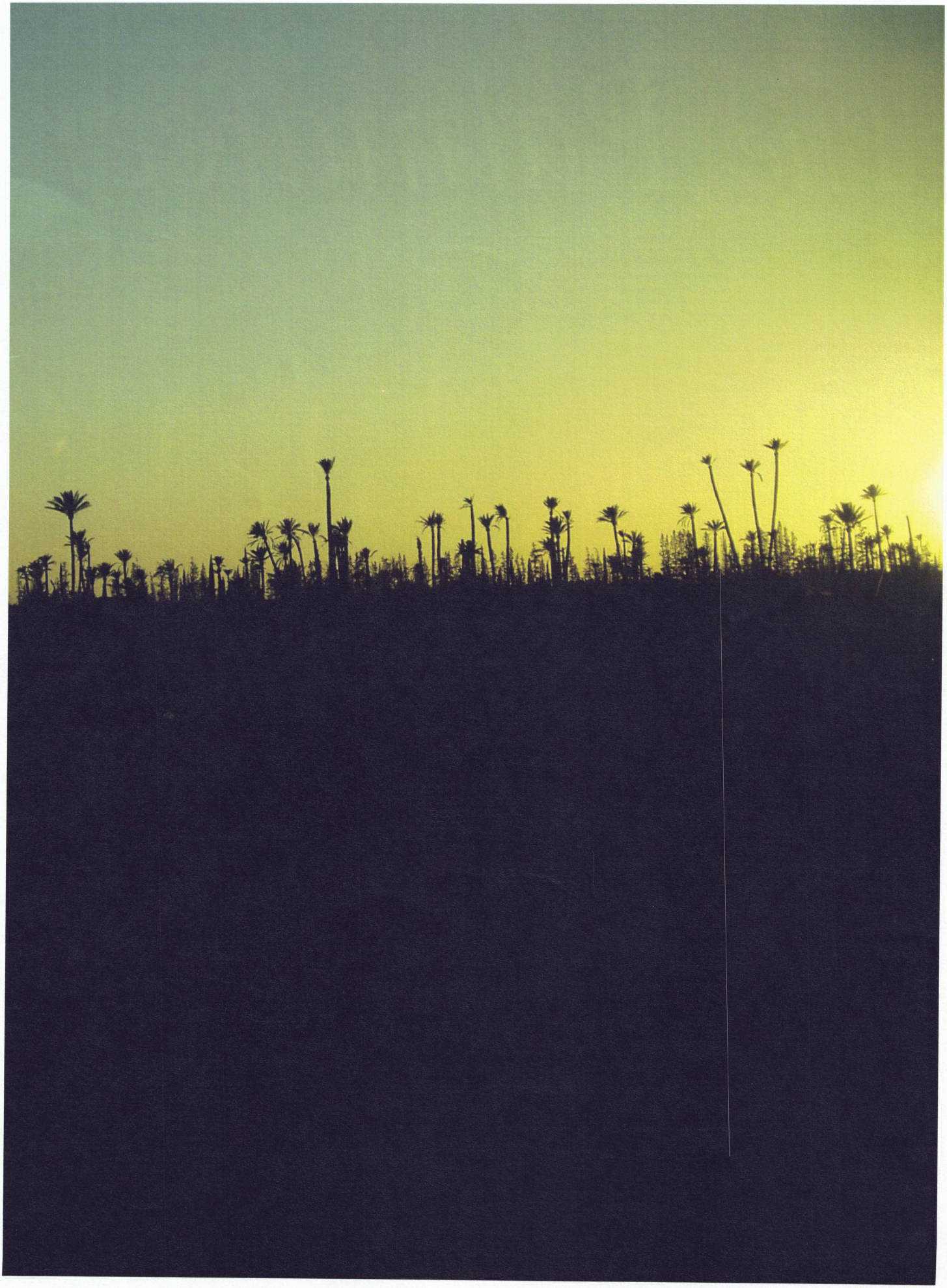
The Palmateer



Central Florida Palm & Cycad Society • Spring, 2010 • Volume 30, Number 1



The Palmateer

Central Florida Palm & Cycad Society

Spring, 2010 • Volume 30, Number 1

Contents

***The Palmateer* Editorial Team**

Editor: Bob Johnson

Contributors: Rene Coativy, Donald Hodel, John Kennedy, William Tang

Layout/Production: Bob Johnson

Front cover: *Chamaerops humilus growing on steep slopes near Fomentor, Majorca, Spain (Photo by Willie Tang).*

Inside front cover: *Silhouettes of date palms (Phoenix dactylifera) at dusk near Marrakech, Morocco (Photo by Willie Tang).*

Back cover: *Rainbow over the Desert - Washingtnia filifera in habitat in southern California (photo by Rene Coativy).*

Right: *Its a bird... its a plane . . . its a . . . flying Phoenix? Phoenix rupicola being lifted by a tree crane to make way for some work at the Prall's in Cape Coral (photo by Geri Prall).*

Central Florida Palm & Cycad Society

www.cfpacs.org

CFPACS 2010 Leadership

Bob Johnson • President
PO Box 560907, Orlando, FL 32856
(407) 438-0250 • president@cfpacs.org

John Green • East Vice-President
6650 Chain Fern Rd., Grant, FL 32949
(321) 729-3973 • eastvp@cfpacs.org

Ron Hart • Central Vice-President
1008 Little Fawn Ct., Apopka, FL 32712
(352) 455-1080 • centralvp@cfpacs.org

Mike Evans • West Vice-President
6015 - 100th Way N., St. Petersburg, FL 33708
(727) 393-8950 • westvp@cfpacs.org

Diana Wehrell-Grabowski • Past-President
541 S. Atlantic Ave., Cocoa Beach, FL 32931
(321) 783-2342 • pastpresident@cfpacs.org

Chuck Grieneisen • Secretary
PO Box 621689, Oviedo, FL 32762
(407) 359-6276 • secretary@cfpacs.org

Catherine Johnson • Treasurer
PO Box 560907, Orlando, FL 32856
(407) 438-0250 • treasurer@cfpacs.org

Karen Barrese • Membership Chair
5942 Ehren Cutoff, Land O Lakes, FL 34639
(813) 996-7148 • membership@cfpacs.org

Frankie Ramos • Webmaster
4169 N. Indian River Dr., Cocoa, FL 32927
(321) 634-5223 • webmaster@cfpacs.org

Mike Dahme • Seed Bank Rep (East)
PO Box 89, Grant, FL 32949
palmasiera@gmail.com

Lucinda McCartney • Seed Bank Rep (West)
4217 Marlin Ln., Palmetto, FL 34221
(941) 375-0239 • mccartney.lucinda@gmail.com

The **Central Florida Palm & Cycad Society** is an affiliate of the **International Palm Society** and **The Cycad Society**. CFPACS is a nonprofit, nonpartisan organization dedicated to scientific and educational projects related to the study of palms and cycads, their propagation, culture, conservation, care, and development. We assist in the preservation of palms and cycads for future generations as well as promote and maintain public interest in palms and cycads.

CFPACS serves the following counties: *Alachua, Brevard, Citrus, DeSoto, Flagler, Hardee, Hernando, Highlands, Hillsborough, Indian River, Lake, Levy, Manatee, Marion, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Putnam, Sarasota, Seminole, St. Lucie, Sumter and Volusia.* We also welcome palm and cycad enthusiasts from beyond Central Florida to become members.

CFPACS Membership Dues for 2010:

US Members (1-year): $15

US Members (3-years): $40

Foreign Members (1-year): $20

Please send dues to:

Karen Barrese
CFPACS Membership Chair
5942 Ehren Cutoff
Land O Lakes, FL 34639

You may also pay by credit card at www.PayPal.com (please indicate "payments@cfpacs.org" in the "to" field).

Advertising: Please contact CFPACS treasurer, Catherine Johnson (e-mail treasurer@cfpacs.org) for advertising rates.

INTERNATIONAL PALM SOCIETY

About the International Palm Society: IPS membership dues are $45 a year. Membership includes a subscription to *Palms*, the quarterly journal of the IPS. For further information on the IPS, please visit their web site: www.palms.org

The Cycad Society
Since 1977

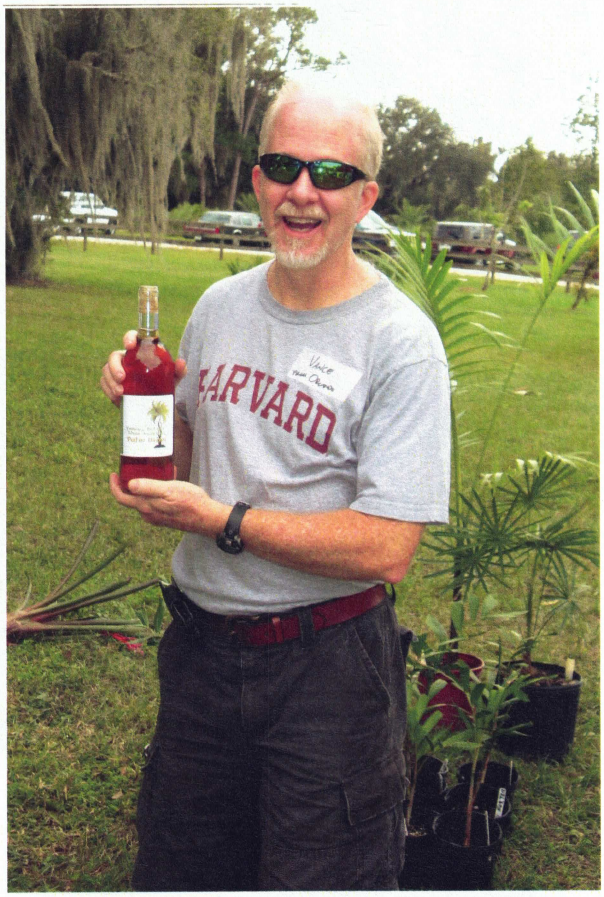
About The Cycad Society: TCS membership dues are $35 a year. Membership includes a subscription to *The Cycad Newsletter*, the quarterly journal of TCS, and access to The Cycad Society seed bank. For further information on the TCS, please visit their web site: www.cycad.org

CFPACS News

compiled by Bob Johnson

Holiday Meeting - Merriment in Myakka

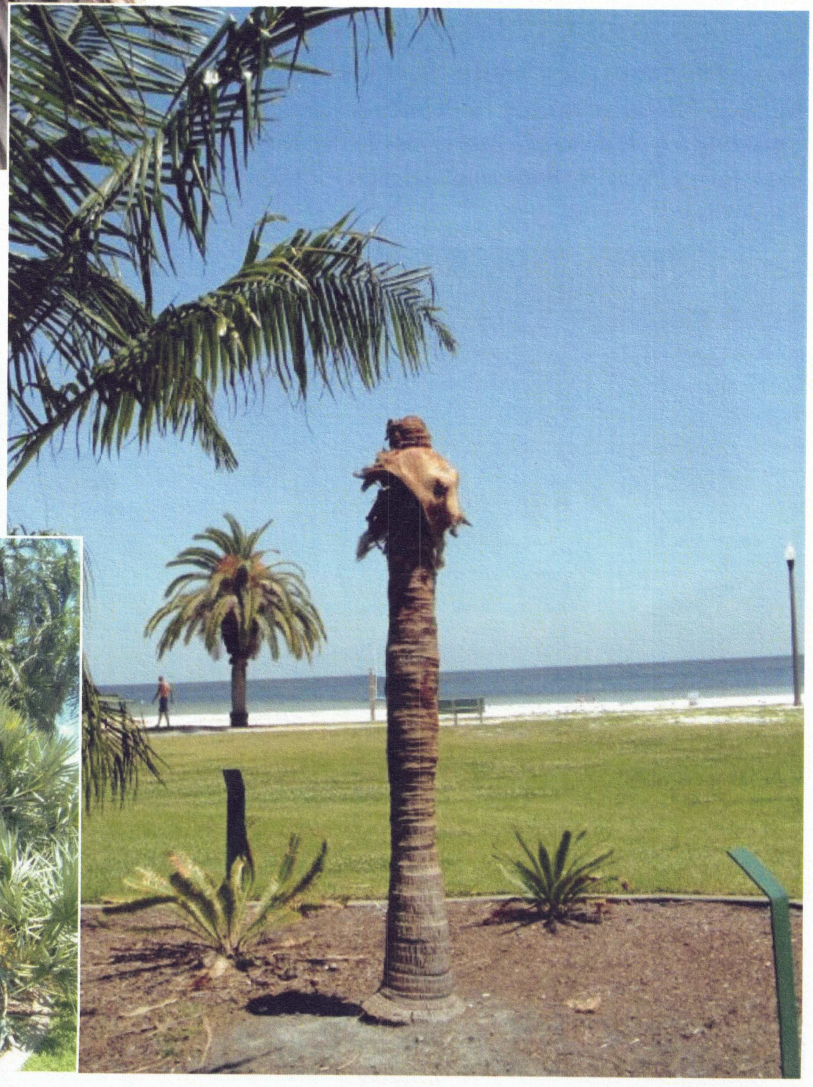
The annual CFPACS holiday meeting was held on December 12 at Faith Bishock's in Old Myakka. About 70 CFPACS members and guests gathered to share a day of feasting and camaraderie. We had an opportunity to enjoy palms planted years ago by one of our pioneer members, the late John Bishock. Many of John and Faith's palms have supplied the CFPACS seed bank with copious seeds throughout the years, much to the enjoyment of those who have raised up palms from those seeds to plant in their own gardens. The day concluded with an auction and plant sale. Members departed full of food, happy memories and new palms and cycads to add to their collections. Special thanks go to meeting hostess Faith Bishock, Rob Branch and Susan Dow who prepared the sumptuous meats, and the many members who brought side dishes for the meal and items to donate for the auction.



Below: Phil Stager and Christian Faulkner conduct the auction at the CFPACS holiday meeting at Faith Bishock's in Old Myakka. Vance Browning (right) donated a case of his "Better Than Average Palm Wine" made from jelly palm (Butia capitata) fruit - it was a big hit! (photos by Bob Johnson)

A Wicked Winter

The winter of 2010 was too cold and too long. It was an unpleasant time for palm and cycad growers. As if the prolonged cold wasn't enough, every cold front was preceded by rain, making the chances for rot even greater as our plants endured the unrelenting - and seemingly unending cold. The scenes depicted on this page were a common site throughout central Florida. For many in our area, this was the second winter in a row that brought damaging frost and temperatures. Many palms that made some recovery from the winter of 2009 were killed by this years' second round. Members are are encouraged to monitor recovery in palms and cycads that were damaged but survived. It is still too early to tell with many of our plants. We will help future generations of palm and cycad growers if we keep detailed records of temperatures, frost, canopy vs. no canopy, which species were killed, and which eventually recovered. While not especially exciting reading, it will be useful to compile data on the winter of 2010 from our region - perhaps it can be published as a supplement to a



Above: Freeze damaged Latania loddigesii at the Gizella Kopsick Palm Arboretum in St. Petersburg. Rick Nale reports that it is pushing out a new spear, so there is hope. Right: Cocconut palm at Kopsick, dead from cold damage. Below: Bottle palms, dead and damaged by the freeze. Kopsick is situated within one of the most favorable microclimates in central Florida - this year's long cruel winter left its mark throughout the region. (photos by Rick Nale).

future *Palmateer* in late 2010 or early 2011 (Any volunteers to compile and edit this information?) . Lets hope that we don't have another winter like this for a long, long time.

Spring Meeting in Vero Beach

Our March 27th spring meeting in Vero Beach was a welcome change for those in attendance. Winter was finally over, and we had the opportunity to tour four gardens that we had never before visited on a CFPACS garden tour. Each garden was different, and relatively unscathed by winter - at least in comparison to other parts of central Florida. Thanks to Justin and Kimberly McSweeny, Andreas Daehnick's, Dave Martin and Lee and Jay Rathbun for opening up their gardens to CFPACS members and guests. It was a great day!

Above: Kentiopsis oliviformis in Justin and Kimberly McSweeny's garden.

Right: Street view of Andreas Daehnick's garden. These were two of our stops for the CFPACS spring garden tour in Vero Beach in March.

(photos by Justin McSweeny)

Other Events: Sales, Epcot

CFPACS growers participated in two sales this spring - the **Florida Institute of Technology Botanical Fest** (March 6) and the **University of South Florida Botanical Garden Spring Sale** (April 10-11). Sales were down slightly from last year, but considering the current econmic conditions, we did surprisingly well. Members participating in the sales were Laura Cordell, Steve Farnsworth, Chuck Grieneisen, Marc Gringas, Bob and Catherine Johnson, Dorothy Kellog, Richard Lundstedt, Lucinda McCartney, Frank Tintera. Thank you, growers for your support of CFPACS.

For the second year in a row, CFPACS had a presence at the **Epcot International Flower and Garden Festival.** CFPACS members Tom Broome, Mike Dahme, John Green, Bob Johnson and Dave Martin helped keep our booth staffed during the weekends of April 16-17 and May 14-16. We spoke to people from throughout the United States and Canada (and beyond) about palms and cycads, and handed out much literature with helpful information on growing cycads and palms. Thanks to all those that helped CFPACS with this educational outreach.

2010 HomeTown Grant Recipients

We are pleased to announce that two HomeTown Grants have been awarded for 2010. Brian Warner received a grant to plant cycads and palms at the Center for Independent Living in Winter Park. Because the planting area at the Center for Independent Living was relatively small, there were funds left over to award a second grant to Dave Floyd for a new palm garden at Surfside Elementary School in Satellite Beach. Congratulations, Brian and Dave for a job well done!

Coming Events

We are looking for **venues for future meetings** - especially for the second half of 2010. As of this writing, there are no meetings scheduled for this fall or winter. Without meeting venues we cannot meet. If you are interested in hosting a meeting, please contact the CFPACS vice president for your area.

CFPACS will participate in the **USF Fall Sale** on **October 9-10.** Please contact CFPACS secretary Chuck Grieneisen for information on participating in this sale.

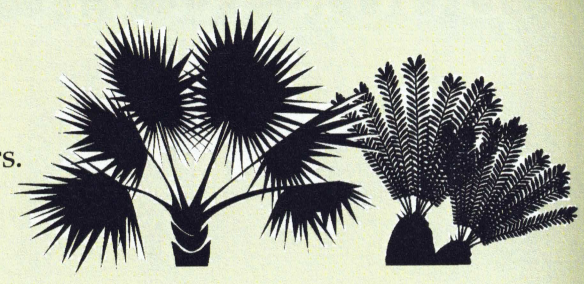
The **Festival of Palms** at FIT in Melbourne is tentatively scheduled for **October 23**. We need an event chairman and committee to coordinate this event. If you are interested in serving as event chairman or as a committee member, please contact CFPACS east vice president John Green.

The **Gizella Kopsick Palm Arboretum** will host a **palm sale** on **November 6** as a part of the City of St. Petersburg Parks Centennial Celebration. If you would like to sell palms at this sale please contact CFPACS west vice president Mike Evans. (contact information for all CFPACS board members can be found on page 4).

Above: Trunking (and branching) seashore palm (Allagoptera arenaria) at the University of South Florida Botanical Garden in Tampa. (photo by Chuck Grieneisen)

Left: 2010 HomeTown Grant recipient Brian Warner and CFPACS secretary Chuck Grieneisen discuss the care of Dioon edule and other cycads and palms just planted at the Center for Independent Living in Winter Park. An Allagoptera frond can be seen on the right - will it grow to be as large as the one at USF someday? (photo by Bob Johnson).

New Members



We extend a **warm welcome** to our newest members.
We are **glad** that you are a part of CFPACS!

United States

Florida

Jeanne Andre, *Indialantic*

John & Samantha Alison, *Satellite Beach*

Justin Brown, *New Smyrna Beach*

Chris Burgr, *Vero Beach*

Rick Buschart, *New Port Richey*

Andreas Daehnick, *Vero Beach*

Chris DeMars, *Merritt Island*

Mike Griffin, *St. Petersburg*

Harry A. Jones, *Indialantic*

Chris Kolp, *Indian Harbour Beach*

Steve Lecher Jr, *Vero Beach*

Lee Rathbun, *Vero Beach*

Jesse Rocha, *Venice*

Steve Ruisis, *Satellite Beach*

Bill Vaughan, *Melbourne*

David A. Wegman, *Tampa*

Matthew Whalen, *Rockledge*

Massachusetts

Philip Kenney, *Littleton*

Vermont

Brenda & Ed Owre, *Burlington*

France

Jean-Bernard Douet, *Maulette*

Correction and Thanks

The spectacular photographs of *Trachycarpus princeps* in habitat that appeared in the Winter 2009 issue of *The Palmateer* were taken by **Stéphane Ringot.** We apologize for the omission. Thank you, Stéphane, for allowing us to publish your photos - they were truly inspirational!

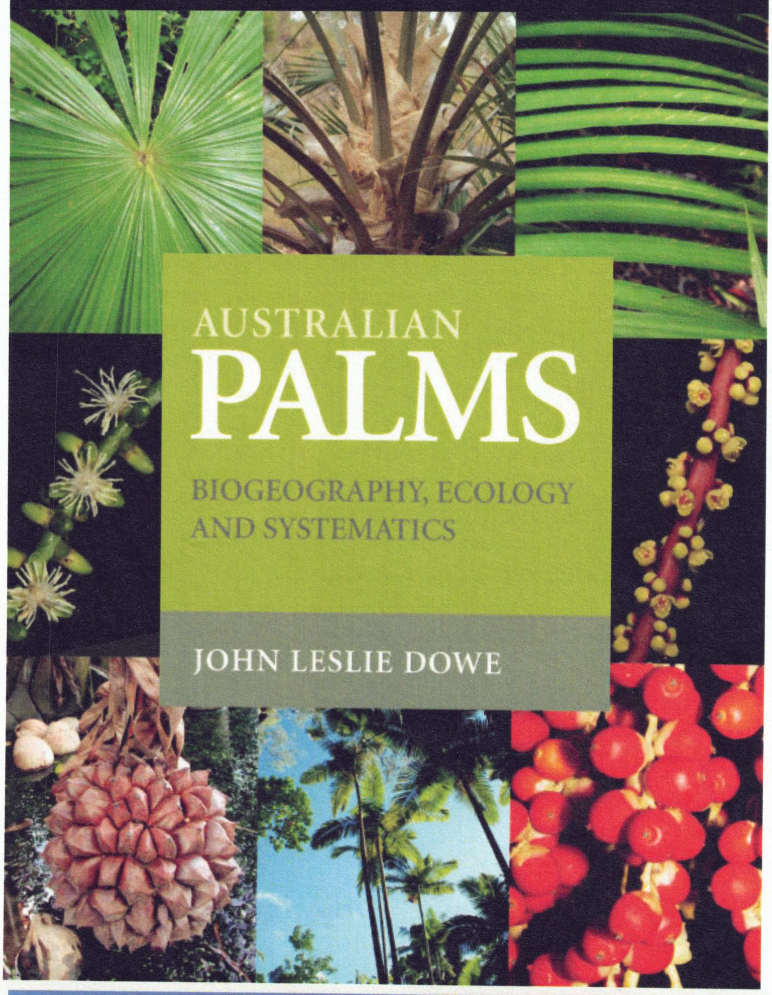
Did you know? CFPACS is on . . .

Facebook
(www.facebook.com/pages/Central-Florida-Palm-Cycad-Society/145851341806)

Twitter (www.twitter.com/centralflapalms

Check it out!

Book Review



John Leslie Dowe, *Australian Palms.* CSIRO Publishing, Collingwood, Victoria, Australia, 2010. 304 pp.

Reviewed by John Kennedy

"All You Ever Wanted to Know About Australian Palms" could well be the title of Dowe's book. Actually, there's considerably more than the reader may have bargained for. This is a book for scientists and for hard-core palm growers. There are beautiful pictures but these take a backseat to a stunning amount of detail. Some members may recall David Jones's *Palms in Australia* (1984, 1987), which had a small picture of each species (native and exotic) and a couple of paragraphs about the palm-a brief botanical description, a little cultural information-as much as then was possible. We were pleased and grateful.

Australian Palms, a handsomely printed paperback, fills a gap in information and is clearly its author's masterwork. As is ever the case with a massive work, it points out areas in which little is clearly known and raises further questions not yet answered. All palm species native to Australia are covered, no exotics except in occasional passing mention.

John Leslie Dowe gave three presentations at Indian River State College in Fort Pierce on August 26-27, 2006, co-sponsored by CFPACS and Heathcote Botanical Gardens, and hosted by the Lifelong Learning Institute of Indian River State College. Two Saturday sessions were devoted to the genus *Livistona* (his revision of the genus was published last year) and to the hurricane/cyclone adaptation of palms. Both topics, clearly of interest to Floridians, are given much space in the new book. His third session, Sunday, was on another interest, *Ptychosperma macarthurii*, on which he had recently written a monograph.

The scope of the new book-to be published in June 2010-is indicated by the subtitle: *Australian Palms: Biogeography, Ecology and Systematics*. How to grow a particular palm in your garden is not part of what's provided. However, you will understand exactly its ecological niche and habitat limitations.

The book has 12 chapters and includes palms on Lord Howe Island, Norfolk Island, and Christmas Island (all three are Australian dependencies).

Chapter 1, "Introduction," sets forth the basics of Australian palms: 60 species (in contrast, New Guinea has about 280 species, New Caledonia 38). All five subfamilies in Arecaceae are represented, the largest genus being *Livistona*, with 18 species.

Chapter 2, "Historical Biogeography," examines contributions of botanists, naturalists, and plant explorers before and after settlement in the 18th century, as well as more recent discoveries. I must admit to not understanding references to Wallace's Line. Familiar to biologists, if not to Florida palm growers, I found online that this is a boundary north-south through the Indonesian islands drawn by 19th century British scientist and explorer, Alfred Wallace, that separates two distinct areas of flora and fauna. To the west (Bali, Java, Borneo and beyond), the life forms are entirely Asian. To the east (Sulawesi [Celebes], Lombok and beyond), these are both Asian and Australian.

Chapter 3, "Historical Biogeography," deals with the fossil record and with climate change. As Australia changed from wet to arid, the habitats for palms shrank.

Chapter 4, "Distribution and Ecology," provides indirect answers to those growing Australian palms. Since 75% of native palms grow in rainforest conditions on a continent where the average annual rainfall is about 15.74 inches, palms are predominant in areas where

rainfall is 47.24 inches or more a year. Of particular interest in this chapter is the importance of fire in shaping Australian flora, with particular emphasis on *Livistona*, which is also impacted by cyclones.
A graph shows the potential life span of various species. Be amazed. *Carpentaria* to 200 years, *Archontophoenix cunninghamiana* to 190 years, *Livistona australis* to 392 years. Overall, says Dowe, Australian palm flora is not well understood. Most examinations have been of a few genera: *Calamus, Livistona, Normanbya*, and the Lord Howe palms.

Chapter 5, "Systematic arrangement of the Australian palm flora," notes that the five major lines of palm evolution are represented on the continent. The five subfamilies are explained, complete with useful tables and key.

Chapter 6, "Subfamily 1: Calamoideae," contains specific descriptions of each of the eight native species of *Calamus*. For each species five pictures of the palm and its parts are provided; a sixth picture is of a herbarium specimen. In addition, a map of Australia is marked with the palm's areas of habitat. The same pattern appears with every subsequent species description in the book.

Chapter 7, "Subfamily 2: Nypoideae," is short since there is only a single species, *Nypa fruticans*.

Chapter 8, "Subfamily 3: Coryphoideae," is a large group of 46 genera and c.450 species with worldwide distribution. In Australia the subfamily numbers five genera and 24 species. Nineteen species are endemic, in three tribes and one subtribe. Many CFPACS members will be particularly interested since all 18 species of Australian *Livistona* are described here.
In the same chapter are descriptions of the single *Licuala* sp., *Licuala ramsayi* and of the sole *Caryota*. Dowe separates what has usually been seen as *C. rumphiana*-once *C. urens*-- into a resurrected older name, *C. albertii*; Kew currently lists this as a synonym. Three *Arenga* species and *Corypha utan* complete the coverage of the subfamily.

Chapter 9, "Subfamily 4: Ceroxyloidae," has only one Australian representative: *Oraniopsis appendiculata*.

Chapter 10, "Subfamily 5: Arecoideae," starts with *Cocos nucifera* before moving on to the six endemic species of *Archontophoenix*. The chapter's treatment of species less familiar to Florida palm growers is enlightening. Here are *Linospadix* (five species), *Lepidorrachis mooreana, Laccospadix australasicus*, and the two *Howea*. Then come some familiar species: *Ptychosperma elegans , P. macarthurii, Carpentaria acuminata, Wodyetia bifurcata*, and *Normanbya normanbyi*.

Perhaps more unexpected by the reader is *Rhopalostylis baueri* from Norfolk Island; *Hedyscepe canterburyana* from Lord Howe Island is also here. An oddity is what Dowe calls "Unplaced Areceae [subfamily]": the three species of *Hydriastele* which offer some problems--where should these go?

Chapter 11, "Doubtful and Excluded Names," tidies up by pointing out synonyms and naturalized exotics, and highlights *nomina nuda*, palms named without supporting evidence. In this chapter, our own 'well-beloved' *Syagrus romanzoffiana* becomes *S. romanzoffianum*, but let's not quibble about Latin endings.

Chapter 12, "Field identification of Australian palm species, consists entirely of a 3-page Key to all 60. Some folks may find this helpful; your reviewer becomes terminally confused by such aids.

Mercifully for the amateur palm grower, a glossary of terms follows Chapter 12. This is succeeded by 12 double-column pages of works cited-the sources Dowe used to create the book. Anyone wishing to track down a reference will be able to find exactly where it was published.

Enough, already. What do I think of the book? It's stunning and overpowering, not for the faint of heart. For anyone wishing to learn more about Australian species that we grow in Florida, it's a wonderful reference source. However, Dowe's *Livistona* monograph (2009) contains all 36 species in the genus, not limited to those in Australia.

Somewhat bothersome is the description of *Livistona* as "functionally dioecious." I would have though the genus either was dioecious or it wasn't; this appears to be an equivocation. While the monograph makes evident that "functionally dioecious" may be true, a more clear explanation in the book would have been helpful to botanical amateurs, that the genus is evolving toward dioecy.

Part of each species description is a statement of the months in which the particular palm flowers and fruits; for many species, of course, the process is not seasonal, but goes on year round.

For anyone wishing to learn more about unfamiliar Australian species, again, the book is an outstanding information source. For curators of palms, for reference librarians everywhere, a must-have. And, unusually, the book is virtually free of typographical errors (found two). The book cover says that Dowe received his Ph.D. in 2001. He sure has been busy, before and since.

Publication date is June 2010. As of this writing, the title does not appear among the palm books offered by the International Palm Society. The list price is $115, but Amazon has it for $95.18, free shipping. The publisher is CSIRO (Commonwealth Scientific and Research Organisation, an Australian government agency). Remember, hundreds of color pictures!

Suddenly *Sabal*, Seriously

Part 1

Article and photos by Donald R. Hodel
University of California
4800 E. Cesar Chavez Ave.
Los Angeles, CA 90022 U.S.A.
drhodel@ucdavis.edu

Introduction

Ever since Scott Zona's fine monograph of Sabal was published nearly 20 years ago (Zona 1990), I have been intending to use it to determine the correct names of the various *Sabal* cultivated in California. However, there were a few diversions along the way, Chamaedorea, New Caledonia, Thailand, the South Pacific and Pritchardia, and the horticulture of landscape palms, to name just a few, which led me astray. But finally Pritchardia "was put to bed" and I found myself with a little time on my hands on a long, cool, mid-winter evening, and, like a thief in the night, *Sabal* was suddenly and seriously upon me. In earnest I delved into *Sabal*, ardently gathering the appropriate literature and visiting the public gardens and plantings in Southern California where this intriguing, useful, and often unfairly overlooked if not discounted or dismissed group of palms is grown.

Using Scott's monograph, I could identify somewhat easily about six species of *Sabal* cultivated in Southern California, including *S. bermudana, S. mauritiiformis, S. minor, S. rosei, S. uresana,* and *S. yapa.* However, several other species, all moderate to large palms with few or no obvious distinguishing characters, proved difficult if not impossible to identify with any degree of confidence. What were these unidentified palms: *Sabal causiarum, S. domingensis, S. guatemalensis, S. maritima, S. mexicana, or S. palmetto?* I realized I was at somewhat of a dead end and needed new, additional resources to identify these other palms accurately.

Unfortunately, I also realized that there were several, related obstacles I had to overcome to identify these other *Sabal.* One was that nearly all *Sabal* in gardens and collections in Southern California were from cultivated sources, primarily gardens in Florida, like Fairchild Tropical Botanic Garden (FTG), or other gardens in California, and were not wild collected. To apply names accurately to the unidentified *Sabal*, it was critical to see documented, wild collected plants. The other obstacle was that I suspected that many *Sabal* in Southern California might be hybrids simply because they were primarily from cultivation, and mostly from large gardens and collections harboring many species of *Sabal* where the possibility of hybridization would be great.

Thus, I realized that I needed to visit to FTG and the Montgomery Botanical Center (MBC) in Miami, Florida both of which have extensive, exceptional holdings of documented, wild-collected *Sabal*, easily the best in the world. So, I was off to Florida in April, 2008 to visit these gardens and examine their *Sabal* collections for a few days. But being an opportunist, I also decided, because I would be at the Caribbean's front door, to make a brief visit to the Dominican Republic to try to resolve the *S. causiarum/S. domingensis* conundrum.

Here are the fruits of my intense but relatively brief labors. I base my findings on Scott's monograph (Zona 1990) and the works of Liberty H. Bailey (1934, 1939, 1940, 1944); excursions to Ventura Community College, Pierce Community College in Woodland Hills, The Huntington, The Los Angeles County Arboretum and Botanic Garden, Elysian Park (Chavez Ravine Arboretum) in Los Angeles, Fullerton Arboretum at California State University in Fullerton, University of California Riverside Botanical Garden, Quail Botanical Gardens in Encinitas, Palomar Community College in San Marcos, and other gardens and collections in California; visits to FTG and the MBC in Florida; and field work in the Dominican Republic.

The visits to FTG and MBC, where I observed and photographed documented, wild-collected plants, were especially illuminating because they made clear that hybridization is likely a major factor muddling an already confusing situation with several species of *Sabal* in California. For example, documented, wild-collected S. etonia at FTG and MBC are similar but still significantly different from plants labeled as such in Southern California but which were grown from seeds collected in Florida gardens! In similar instances, wild-collected S. maritima and *S. mexicana* at FTG and MBC are only somewhat similar to plants purportedly of these species in several gardens and collections in southern California. In other instances, there are *Sabal* cultivated in southern California that are similar to but do not exactly fit the species as Scott described them in his monograph (Zona 1990). While varying climate, substrate, and culture or management might account for some of the differences between the Florida and California plants, the differences are too great to be due solely to varying growing conditions, and it seems likely that there are significant genetic differences resulting from hybridization. Other possible explanations for these discrepancies include descriptions that fail to encompass the entire variability of a species and the existence of as yet undescribed species.

Sabal

Sabal includes about 15 species of solitary, small to large fan or palmate-leaved palms distributed from the southeastern and southern United States through Mexico and the Caribbean to Central America and northwestern South America. Mexico has by far the most species, with eight, followed by the United States with five and Cuba with four species. *Sabal* is usually easily recognized by its typically strongly recurved and prominently costapalmate leaf blade (petiole markedly extending into the blade) and unarmed petioles, which readily distinguish it from other fan palms.

Although petioles are unarmed (without thorns or spines), petiole margins on most *Sabal* are unusually sharp and hard (knife-like), and moving one's hand or arm along it carelessly can result in a serious wound. Leaf blades vary in the distance in which the segments are united in their basal portion. The united portion is referred to as the palmen. Segments of *S. bermudana* are united for about 50% their length, forming a palmen about half the diameter of the blade, while those of most other species are joined even less, from as little as 15% to 40%. Two species, *S. mauritiiformis* and *S. yapa*, have segments joined in groups of two or three for half to nearly their entire length, with little or no connection between groups. Segments typically ascend off the strongly recurved costa or petiole extension, giving the blade a v-shaped or trough-like appearance. Segment tips are split or bifid for varying lengths and rigid or drooping. Blades of nearly all species have a hanging, often curling, thread-like filament arising from the apical joining point of segments.

Trunks of *Sabal* range from short or subterranean in *S. minor* and *S. etonia* to 50 feet tall and up to three feet wide in *S. causiarum*. Trunks often remained clothed in persistent leaf bases and old, woody petiole stubs for years. Once free of leaf bases, trunks range from smooth and whitish in *S. causiarum* to brown or tan, rough, slightly fissured, and of a corky texture in most other species. When in the establishment phase, just prior to vertical elongation of the trunk, and especially with some light shade, the large Sabals can be exceedingly handsome with their full contingent of leaves appearing to arise directly from the ground and characterized by large blades and long petioles (Fig. 1).

Inflorescences (and infructescences), which are borne among the leaves, are equally variable in length, degree of branching, and position or orientation. Those of *S. minor* are erect, branched mostly to two orders, and typically greatly exceed the leaves while those of *S. bermudana* are arching, branched to three orders, and usually do not exceed the petiole. Erect or ascending inflorescences in flower may sag or hang later under the weight of fruits. Flowers of *Sabal* are solitary and are perfect or bisexual (have functional male or staminate and female or pistillate parts). The relatively small fruits, which can be produced in abundance, range from 0.25 to 1.1 inches in diameter, are usually black when ripe, and are variable shaped, from spherical to wider than long or pear-shaped.

Zona (1990) noted that *Sabal* is "often weedy, thriving in anthropogenic habitats." Indeed, while most species are forest palms, they tend to languish in the lower light understory and do best when their crown of leaves is in or thrust above the canopy and into higher light. They are remarkably successful or even excel when forest is cleared or in patchy, open, high-light, often disturbed situations. Only a few species, such as *S. etonia*, *S. minor*, and the probably extinct *S. miamiensis*, have a low, short habit and are true understory dwellers. A few species, especially those from western and northwestern Mexico, including *S. pumos*, *S. rosei*, and *S. uresana*, occur in dry or desert habitats.

Most *Sabal* seed freely and it is common to find volunteer seedlings below or around mature trees in gardens and the landscape. The relatively small fruits have a sweet, pulpy, nearly date-like flesh surrounding the seeds, making them attractive to birds and other fruit-dispersing animals. Because of their easily dispersed fruits and ability to thrive in disturbed situations, most *Sabal* must be considered as potentially invasive species. That said, though, their tough, hardy, durable nature and signature leaves, often of an attractive grayish cast, make them good choices for the Southern California palm garden and landscape.

With a few notable exceptions, the species of *Sabal* are difficult to distinguish from each other. There is a long history of misidentification of cultivated specimens. Most species look similar and the specter of artificial hybrids in cultivation provides the possibility of innumerable intermediate forms. A combination of characters is usually necessary to identify *Sabal* species accurately.

Figure 1 - When still in the trunkless juvenile stage large Sabals can be exceedingly handsome with their full contingent of leaves appearing to arise directly from the ground and characterized by large blades and long petioles.

Key to the Species of Sabal

Mature plants lacking visible, above-ground trunk, or if trunk present then only to about five feet tall.

Inflorescence arching, branched to three orders ..... *S. miamiensis*

Inflorescence erect or ascending, usually branched to two orders.

Inflorescence erect, usually exceeding leaves, sparsely branched; blade weakly costapalmate, nearly flat ..... *S. minor*

Inflorescence ascending, not exceeding leaves, densely branched; blade strongly costapalmate, recurved ..... *S. etonia*

Mature plants with well-developed above-ground trunk, typically from 15 to 50 feet tall.

Segments joined in groups of 2-3

Blade usually with glaucous bloom, weakly costapalmate, nearly flat, segments joined in groups of 2-3 for nearly their entire length; inflorescences branched to four orders ..... *S. mauritiiformis*

Blade green, moderately costapalmate, recurved, segments joined in groups of 2 for 50% their length; inflorescence branched to three orders ..... *S. yapa*

Segments not joined in groups of 2-3

Inflorescences shorter than to equaling petioles.

Second-order inflorescence branches short, usually covered by bracts of first-order branches, rachillae appearing bunched ..... *S. bermudana*

Second-order inflorescence branches long, not covered by bracts of first-order branches, rachillae not appearing bunched ..... *S. pumos*

Inflorescences longer than petioles to exceeding the leaves.

Petals conspicuously ribbed or nerved when dry.

Fruit more or less spherical, 0.60-0.75 inch diameter ..... *S. mexicana (including S. gretherae)*

Fruit pear-shaped or depressed pear-shaped, 0.40-0.55 inch diameter ..... *S. guatemalensis*

Petals not conspicuously ribbed or nerved when dry.

Fruit greater than 0.60 inch diameter.

Leaves green; rachillae curling ..... *S. rosei*

Leaves gray; rachillae stiff ..... *S. uresana*

Fruit less than 0.60 inch diameter.

Petiole base with large, elongate (10-20 inches), conspicuous, tan, flap-like ligules on either side ..... *S. causiarum*

Petiole lacking large, conspicuous ligules, or if ligule present then small, triangular to square-shaped, and short (2-4 inches).

Petiole with small ligule, densely covered with whitish brown to tan scales ..... *S. maritima*

Petiole without ligule, whitish brown scales mostly lacking.

Massive palm; trunk 2-3 feet in diameter; inflorescences greater than to equaling leaves; fruit pear-shaped ..... *S. domingensis*

Moderate palm; trunk 1 foot diameter; inflorescences about equaling leaves; fruit more or less spherical ..... *S. palmetto*

Figure 2 - Sabal bermudana grows slowly to about 25 feet tall (Fairchild Tropical Botanic Garden, RM 1884 A).

Figure 3 - Inflorescences of Sabal bermudana do not exceed the petiole (Ventura Community College).

Figure 4 - Second-order branches of the inflorescence of Sabal bermudana do not extend much beyond the sheathing bracts, making the rachillae appear bundled or in rather tight fascicles (Ventura Community College).

Figure 5 - White Park in Riverside has an old but handsome specimen of Sabal bermudana.

Characters include the presence or absence of a well developed above-ground trunk, the arrangement and degree of joining of leaf blade segments, the position of inflorescences in flower and their length relative to that of the petiole and leaf blade of the subtending leaf, the number or degree of inflorescence branch orders, petal shape and presence of ribs, and fruit size and shape. The position or manner in which the inflorescence is held and its length relative to the petiole and leaf blade may not be too reliable. A better character might be the length of the peduncle (unbranched portion) relative to the length of the entire inflorescence or to the rachis (branched portion) of the inflorescence.

Sabal bermudana (*S. beccariana, S. blackburniana, S. princeps*). Bermuda palmetto.

Moderate palm; trunk to 25 feet tall (Fig. 2), 8-14 inches diameter, rough, brown; leaves 15-25, leaf blade strongly costapalmate and recurved, green, filiferous, *palmen about one-half of blade*, tips stiff; inflorescences arching, *not exceeding petiole* (Fig. 3), branched to three orders, peduncle lacking to one-sixth of inflorescence length; fruit pear-shaped, 0.50-0.70 inch wide, 0.50-0.75 inch high.

As the epithet implies, *Sabal bermudana* occurs on Bermuda. The relatively large palmen, relatively wide and stiff segment tips, and inflorescences not exceeding the petiole readily distinguish this species. The inflorescence is also distinctive in its short second-order branches that do not extend much beyond the sheathing bracts, making the rachillae appear bundled or in rather tight fascicles (Fig 4). Because of the relatively large palmen and wide, stiff segment tips, the crown of leaves has a somewhat stiff, coarse appearance.

Authentic *Sabal bermudana* is rarely cultivated in Southern California, and I have only observed plants at Ventura Community College, The Huntington, and White Park in Riverside (Fig. 5) that

match the description in Scott's monograph. In contrast, many locations, including Pierce Community College, Elysian Park, Fullerton Arboretum, and Quail Botanical Gardens, have plants similar to *S. bermudana* but are somewhat variable, probably due to hybridization. Plants at Elysian Park, the Fullerton Arboretum, and Quail Botanical Gardens have stiffly ascending inflorescences that tend slightly to exceed the petiole in length. Because they are so distinctive, I have identified these as *Sabal* "Ascending Inflorescence" (which see below under "Other Entities").

Some specimens similar but somewhat different to *Sabal bermudana* are identified in Southern California gardens as *Sabal* "Riverside". See below under "Other Entities" for an explanation of this name.


Fig. 6


Fig. 7

Sabal causiarum (*S. haitensis*, *S. questeliana*, *S. umbraculifera*). Puerto Rico hat palm, *palm cana*.

Massive, robust, splendid palm (Fig. 6), to 50 feet tall, *2-3 feet diameter, more or less smooth, grayish*; leaves 20-30, leaf blade strongly costapalmate and recurved, green or glaucous, filiferous, palmen about two-fifths of blade, tips floppy, usually with *conspicuous, large, tan, flap-like ligules at petiole base* (Fig. 7); inflorescences somewhat variable but arching, about equaling leaves to exceeding them, branched to three orders, peduncle one-third to one-half of inflorescence length; fruit spherical, 0.25-0.45 inch in diameter.


Fig. 8

This magnificent palm occurs in Puerto Rico, the Dominican Republic and Haiti on the island of Hispaniola, and Anegada in the British Virgin Islands. It is fairly common throughout much of the Dominican Republic where its leaves (and those of the sometimes co-occurring *S. domingensis*) are used extensively for roof thatching. Indeed, wild and cultivated plants frequently have only a half crown of leaves or even less due to removal for the thatch industry. Barahona Province in southwestern Dominican Republic has especially abundant stands of this palm, and, because of their

Figure 6 - Sabal causiarum is a massive, robust, splendid palm (Fairchild Tropical Botanic Garden, 73200 A, ex Dominican Republic).

Figure 7 - The usually large, conspicuous, tan, flap-like ligules at the petiole base are diagnostic for Sabal causiarum (Montgomery Botanical Center, 96350 E, ex Dominican Republic).

Figure 8 - A large, handsome specimen of Sabal causiarum grows in the palmetum at Elysian Park near downtown Los Angeles.

large size, are clearly visible and conspicuous from miles away as they cover the coastal hillsides. Plants typically have long petioles, giving an open appearance to the crown, although this is not always the case because the large, much-branched inflorescences emerging from among the leaves result in a dense, congested crown.

Sabal causiarum is a truly massive and splendid palm, one of the most stunning species that can be grown in Southern California. Elysian Park in Los Angeles (Fig. 8) and especially Palomar Community College in San Marcos (Fig. 9) have absolutely spectacular specimens. The one at Palomar has slightly glaucous leaves and petioles and is somewhat reminiscent of *Bismarckia nobilis*. Other specimens can be found at The Huntington, White Park in Riverside, and Quail Botanical Gardens in Encinitas.

Inflorescence architecture varies considerably among the cultivated *Sabal causiarum*. The typical condition is a densely branched, bushy inflorescence about equaling the leaves or slightly exceeding them with the peduncle about one-third the length of the inflorescence. First-order branches are relatively long so the branched portion of the inflorescence appears quite wide. In contrast the Palomar and Huntington specimens have conspicuous, exceptionally long peduncles comprising about one-half the length of the inflorescence. The branched portion appears elongated, narrow, bushy, and nearly plumose because of the short, densely branched and closely spaced first-order branches, giving this section of the inflorescence the distinctive appearance of a fox's tail (Fig 10). Pendulous infructescences heavily laden with fruit amplify this effect because the weight of the fruits tends to pull the first-order branches closer to the rachis or main stalk, making the branched portion even narrower and more compact. Bailey (1939, Fig. 176, p. 274) illustrated such an inflorescence although he erroneously referred to the palm as *S. umbraculifera*. Intermediate forms of inflorescence architecture may represent natural genetic variability or hybridization.

The conspicuous, large, tan, flap-like ligules on either side of the petiole at its base easily distinguish *Sabal causiarum*, even in a juvenile stage before it attains such distinctive massive and splendid proportions (Fig. 11). These ligules are actually an extension of the leaf sheath along the basal margins of the petiole. Initially green

Figure 9 - Palomar Community College has an exceedingly splendid specimen of Sabal causiarum that is striking similar in general appearance to Bismarckia nobilis.

Figure 10 - Some specimens of Sabal causiarum have unusual inflorescences with the branched portion appearing elongated, narrow, bushy, and nearly plumose because of the short, densely branched and closely spaced first-order branches, giving this section the distinctive appearance of a fox's tail (Palomar Community College).

Figure 11 - The conspicuous flap-like ligules on either side of the petiole at its base easily distinguish Sabal causiarum, even in a juvenile stage (Quail Botanical Gardens).

when young and still intact, the expanding pressure of emerging inside newer leaves eventually tears them asunder and they dry and or age to tan and typically hang like a flap from the petiole or they may persist as a wing along the petiole margin. They are large, up to 20 inches long and four inches wide, and easily discernable even from a great distance.

I first noticed these distinctive, conspicuous ligules on a specimen in the garden of the late Richard Palmer of Whittier in 1988, and I referred to this species over the years as the "*Sabal* with the big ligules." However, I was much surprised, even dumbfounded, when I could find no mention of these ligules in Scott's 1990 *Sabal* monograph. In 2000 I was in Florida and saw and photographed these ligules on a *Sabal* in a private garden. I sent the photographs and a note to Scott asking him the name of this *Sabal*. Scott responded by saying that he was unaware which species had these ligules.

As I delved deeper into *Sabal* this past winter, I discovered that Bailey actually made note of the ligules but he placed little emphasis on them as a distinguishing character. Although not calling them ligules, he noted them on *S. causiarum* (Bailey 1934, 1944), *S. questeliana* (Bailey 1944), and *S. umbraculifera* (Bailey 1944). Bailey (1934, fig. 174, p. 314) actually has a photograph of *S. causiarum* in Puerto Rico with the ligules. Similarly, he (Bailey 1944, fig. 226, p. 423) has a photograph of a juvenile *S. questeliana* that clearly shows the ligules nestled among the petiole bases. Although not mentioning them in another account (Bailey 1939), he shows a photograph of a *S. umbraculifera* in the Dominican Republic (fig. 174, p. 272) that has ligules. Scott (Zona 1990) included *S. questeliana* as a synonym of *S. causiarum*, and noted that several workers, including Bailey, had erroneously applied the name *S. umbraculifera* to palms from Hispaniola, which would mean they must be *S. causiarum* or *S. domingensis*, the only two species known from the island. Thus, I began to suspect that the "*Sabal* with the big ligules" was *S. causiarum*.

Sabal causiarum and *S. domingensis* are similar and perhaps not distinct, and may simply represent the two ends of the range of one variable species. Indeed, both names have been used in horticulture for this massive, splendid *Sabal* yet Scott (Zona 1990) had maintained the two as separate species on the basis of differences in fruit size and shape, characters that may not be too reliable. This *S. causiarum* / *S. domingensis* conundrum was the impetus for a visit to Florida and the Dominican Republic in April 2008. In Florida I found that FTG and MBC have several similar if not identical-looking accessions from Puerto Rico and the Dominican Republic with the large ligules. Those from Puerto Rico were invariably labeled *S. causiarum* while those from the Dominican Republic were labeled *S. domingensis* or less frequently *S. causiarum*. Because the type specimen of *S. causiarum* is from Puerto Rico, it is clear that the "*Sabal* with the big ligules" is *S. causiarum*.

In the Dominican Republic I observed *Sabal causiarum* in and around Santo Domingo, including the National Botanical Garden (where it was invariably labeled *S. domingensis*), along the south and southeast coast and adjacent hills (Fig. 12), and in and around Santiago in the north central part of the country. In Scott's 1990 monograph he cited specimens from southeastern Dominican Republic as *S. causiarum* and those from Moca near Santiago as *S. domingensis*. Thus, Moca, just to the southeast of Santiago, was a critical location for me to visit, and it proved to be somewhat revealing but also a little perplexing. A few miles southeast of Moca were scattered stands of what was clearly *S. causiarum* because

Fig. 12

of the presence of conspicuous ligules while a few miles northwest of Moca were rather extensive populations containing a mixture of *S. causiarum* and a *Sabal* sp. without ligules, which I took to be *S. domingensis*, as well as some specimens exhibiting an intermediate state with simply a narrow wing-like appendage along the margins of the petiole near the base. *Sabal causiarum* was by far the much more common of the two, though, and I surmised that it was the more typical condition.

Figure 12 - Sabal causiarum is a conspicuous and sometimes dominant element of the coastal hills of Barahona in southwestern Dominican Republic.

Figure 13 - Sabal domingensis is also a massive, robust, splendid palm (Ventura Community College).

Figure 14 - The lack of the conspicuous flap-like ligule at the petiole base distinguishes Sabal domingensis from the otherwise similar and perhaps not distinct S. causiarum (Moca, Dominican Republic).

In summary, *Sabal causiarum* and *S. domingensis* are similar but the latter can be distinguished by the lack of the ligules at the petiole base and the larger, pear-shaped fruits. More work is needed on this complex, though, and, if they prove to be the same, *S. causiarum*, being the older name, would have priority.

Sabal domingensis (*S. umbraculifera*). *Palma cana*.

Massive, robust, splendid palm (Fig. 13); trunk to 50 feet tall, *2-3 feet diameter, more or less smooth, brownish to grayish*; leaves 20-30, leaf blade strongly costapalmate and recurved, green or glaucous, filiferous, palmen about two-fifths of blade, tips floppy, *lacking ligules at petiole base* (Fig. 14); inflorescences arching, about equaling leaves to exceeding them, branched to three orders, peduncle one-fourth to one-third of inflorescence length; fruit pear-shaped, 0.45-0.55 inch wide, 0.40-0.55 inch high.

Another striking species, *Sabal domingensis* occurs sparingly in moist forest and disturbed areas in the interior of Hispaniola and eastern Cuba. In the Dominican Republic it occurs with and is similar to *S. causiarum*, and both are used extensively for thatch, but the conspicuous ligules at the petiole base and the smaller, spherical fruits distinguish this latter species. Thatch producers do not distinguish between *S. domingensis* and *S. causiarum*.

Handsome specimens of *Sabal domingensis* can be seen at Ventura Community College, Pierce Community College, The Huntington, Fullerton Arboretum, Palomar Community College, and the University of California Riverside Botanical Garden.

Some specimens of *Sabal domingensis* have been identified in Southern California collections as *Sabal* "Riverside". See below under "Other Entities" for an explanation of this name.

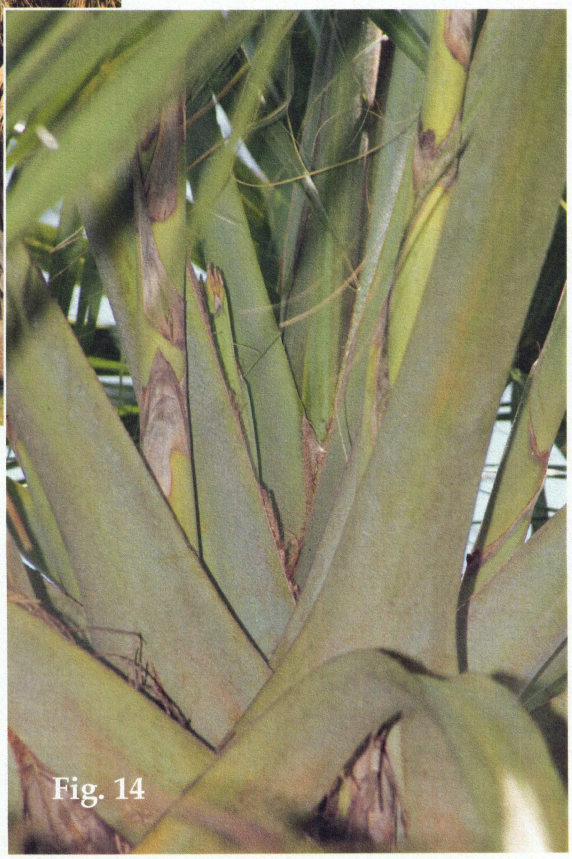


Figure 15 - Sabal etonia is a small, trunkless palm with usually strongly recurved leaf blades (Fairchild Tropical Botanic Garden, 78803).

Figure 16 - The densely branched inflorescences appearing bushy and congested and not exceeding leaves help to distinguish Sabal etonia (Fairchild Tropical Botanic Garden, 78803, ex Highlands County, Florida).

Figure 17 - This specimen of Sabal etonia at Quail Botanical Gardens may be the only one in Southern California (99.0058).

Figure 18 - A large palm, Sabal guatemalensis is similar to S. mexicana (Fairchild Tropical Botanic Garden, 941048, ex Guatemala).

Sabal etonia (*S. adansonii* var. *megacarpa*). Scrub palmetto.

Small palm (Fig. 15); *trunk usually subterranean* or sometimes to 6 feet tall and then covered with persistent leaf bases becoming bare only after many years, 6-10 inches diameter; leaves 7-12, leaf blade strongly costapalmate and recurved, green or light green, filiferous, palmen small, about one-sixth of blade, tips stiff; *inflorescences ascending, not exceeding leaves, densely branched to two or rarely three orders, appearing bushy and congested* (Fig. 16), peduncle lacking to one-eighth of inflorescence length; fruit more or less spherical, wider than long, *0.35-0.60 inch wide, 0.33-0.50 inch high.*

The scrub palmetto is restricted to sandy soils of mesic to dry pine/oak or "sand pine scrub" forest in central and southeastern Florida. Urbanization has destroyed most of its habitat in southeastern Florida. It is one of the few *Sabal* not considered weedy and is primarily found in undisturbed conditions. Because of its small habit and trunkless nature, *Sabal etonia* might be confused with *S. minor* but the latter differs in its mostly flat leaf blade and erect, sparsely branched inflorescences typically exceeding the leaves.

Sabal etonia is little cultivated in Southern California, and the only authentic specimen may be at Quail Botanical Gardens (Fig. 17). The Huntington has several large, fruiting specimens labeled as such but of unknown origin. Their very large size, which is dramatically different from that of wild-collected plants at FTG and MBC in Florida, may be indicative of hybridization. Although of solitary habit, plants at The Huntington form large clumps 10 to 15 feet across, likely the result of fruits falling from and germinating at the base of the original plant. Among the numerous plants forming the large clump are one or two that bear an uncanny resemblance to *S. minor* and are probably the result of hybridization.

Type to enter text

Sabal gretherae.

Medium palm; trunk to 25 feet tall, 8-12 inches diameter, covered with persistent leaf bases for many years, eventually rough, brown; leaves

Fig. 18

25-35, leaf blade strongly costapalmate and recurved, green, filiferous, palmen about one-third of blade, tips stiff to floppy; inflorescences somewhat ascending, slightly less than to equaling leaves, branched to three orders; *petals strongly ribbed or nerved when dry; fruit spherical to pear-shaped, slightly wider than long, 0.60-0.80 inch wide, 0.60-0.70 inch high.*

Probably not cultivated in Southern California, *Sabal gretherae*, restricted to the vicinity of Chiquila in Quintana Roo at the northernmost point of the Yucatan Peninsula in Mexico, is similar to and perhaps not distinct from the wide-ranging and variable *S. mexicana*. The latter differs in its arching inflorescences and flowers with different shaped petals.

Sabal guatemalensis. Guatemala palmetto.

Large palm (Fig. 18); trunk to 50 feet tall, 10-14 inches diameter, rough, brown but covered with persistent leaf bases for many years; leaves 10-25, leaf blade strongly costapalmate and recurved, green, filiferous, palmen about one-third of blade, tips stiff to floppy; inflorescences ascending to arching, equaling leaves, branched to three orders, peduncle one-half of inflorescence length; *petals strongly ribbed or nerved when dry; fruit more or less pear-shaped*, slightly wider than long, *0.40-0.55 inch wide and high.*

Probably not cultivated in Southern California, this little-known species occurs in mesic and dry, disturbed forest in southern Mexico and Guatemala. It is similar to and perhaps not distinct from the wide-ranging and variable *S. mexicana* but the latter can be distinguished by its different shaped flowers and larger, spherical fruits.

Sabal maritima (*S. florida, S. jamaicensis*).

Large palm (Figs. 19, 20); trunk to 50 feet tall, 10-16 inches diameter, rough, brown; leaves 15-25, leaf blade strongly costapalmate and recurved, green, sometimes with glaucous bloom, filiferous, palmen about one-third of blade, tips soft, *petioles densely covered with light-colored scales and appearing whitish or tan* (Fig. 21), *small, triangular to square-shape ligule at petiole base* (Fig. 22); *inflorescences ascending*, equaling leaves, branched to three orders, peduncle one-fourth to one-third of inflorescence length; *rachillae very densely flowered*; fruit more or less spherical to pear-shaped, slightly wider than long, 0.30-0.55 inch wide, 0.30-0.50 inch high.

Sabal maritima occurs in disturbed moist forest and other areas in Jamaica and Cuba. The whitish brown or tan petioles, small ligule at the petiole base, ascending inflorescences, and densely flowered rachillae distinguish this species. In its pure form it is little if at all cultivated in Southern California. Gary wood in Fallbrook appears to have a juvenile plant that has yet to form trunk.


Fig. 20


Fig. 21

When I began my *Sabal* investigations this past winter I noticed a somewhat distinctive species at the Fullerton Arboretum, The Los Angeles County Arboretum and Botanic Garden, The Huntington, Elysian Park, and Ralph Velez's garden in Westminster that I referred to as *Sabal* "Big Floppy" (which see under "Other Entities") because it is distinctive in its large, coarse, leaf blades with a glaucous bloom and wide, soft, exceedingly droopy or floppy segment tips. It is a rather handsome plant that is somewhat similar in leaf to plants of *S. maritima* at FTG that were collected in Jamaica, thus I feel that "Big Floppy" may be a hybrid, with *S. maritima* as one of its parents.


Fig. 19

Figure 19 - Sabal maritima is a somewhat variable but large palm often with leaves having a grayish cast (Fairchild Tropical Botanic Garden, 931029 J, ex Jamaica).

Figure 20 - This otherwise attractive specimen of Sabal maritima at Foster Garden in Honolulu displays symptoms of potassium and/or magnesium deficiencies on the older leaves (63.0246).

Figure 21 - The petioles densely covered with light-colored scales and appearing whitish or tan distinguish Sabal maritima (Foster Garden, 63.0246).

Figure 22 - Small, triangular to square-shape ligules at the petiole bases help to distinguish Sabal maritima (Montgomery Botanical


Fig. 22

Sabal mauritiiformis (*S. allenii, S. glaucescens, S. morrisiana, S. nematoclada*).

Large palm (Fig. 23); trunk to 80 feet tall, slender, 6-10 inches diameter, often covered with persistent green leaf bases when young, prominently ringed when young, aging to brownish gray; leaves 15-25, leaf blade weakly costapalmate and nearly flat, mostly dark green above and glaucous gray below, palmen about one-third of blade, not filiferous, *segments aggregated mostly in groups of three (rarely two) for nearly entire length* (Fig. 24), tips drooping; *inflorescences ascending, exceeding leaves, branched to four orders*, peduncle one-half of inflorescence length; fruit spherical to pear-shaped, 0.35-0.45 inch wide and high.

Sabal mauritiiformis occurs in moist to wet, undisturbed and disturbed forest and other areas in southern Mexico, Belize, Guatemala, Costa Rica, Panama, Colombia, Venezuela, and Trinidad. Often occurring on limestone, *S. mauritiiformis* is rather sporadically distributed across its range but where it does occur it can be fairly abundant.

Fairly common in collections in Southern California (Fig. 25), *Sabal mauritiiformis* is the most cold-tender species in the genus but also the fastest-growing. Trunks can grow to eight feet tall and still be covered with live, green


Fig. 23


Fig. 24

Figure 23 - Sabal mauritiiformis is a large, fast-growing palm (Hoomaluhia Botanical Garden, Honolulu, 79.1086)

Figure 24 - Leaf segments in Sabal mauritiiformis are aggregated into groups of two or three for nearly their entire length (Ventura Community College).

leaves to the soil line. Internodes, especially on the lower part of the trunk when growth was exceptionally fast, can be as long as four inches while in most other species they are less than an inch long (Fig. 26) . Its large, round leaf blades with segments aggregated in groups of threes, and typically green above and conspicuously gray below, are unusually handsome. Well grown trunkless, juvenile plants in shade are especially stunning and handsome with their immense, flat, round leaf blades up to eight feet across held at the ends of long, arching petioles that arise in a rosette directly from the ground (Fig. 27). Exercise care when selecting a planting site for *S. mauritiiformis*, though, because wind easily shreds and tatters the striking leaves, detracting greatly from their beauty.


Fig. 27

Because its leaf blade segments are also aggregated in groups, *Sabal yapa* is similar to and can be confused with *S. mauritiiformis*. However, *S. yapa* differs in its leaf blade segments aggregated mostly in groups of two and for only about half their length and inflorescences branched to three orders. ***Continued next issue.***

Special thanks to the Palm Society of Southern California for granting CFPACS permission to reprint this article (Originally published in ***The Palm Journal****, Issue #190).*


Fig. 25

Figure 25 - Although the most cold sensitive species in the genus, Sabal mauritiiformis performs adequately in most areas of coastal Southern California (Pauleen Sullivan's apartments, Ventura).


Fig. 26

Figure 26 - Internodes of Sabal mauritiiformis can be as long as four inches while in most other species in the genus they are less than an inch long (Foster Garden, F 2887).

Figure 27 - Well grown trunkless, juvenile plants of Sabal mauritiiformis in shade are especially stunning and handsome with their immense, flat, round leaf blades held at the ends of long, arching petioles that arise in a rosette directly from the ground (Catamaran Hotel, San Diego, with Michael Marika).

Rainbow Over the Desert

Article and photos by Rene Coativy

How many Americans know that *Washingtonia filifera* is not only native but endemic to the southwestern USA (southern California and to a lesser extent extreme west Arizona). I have always been especially fond of this species for one good reason - it is the first species I have ever seen in habitat! It happened in November 1994 while we were touring southern California with a group of *"Fous de palmiers"*, the French chapter of the IPS. My interest in palms was just growing at that time, even if I had not planted any yet!! The meeting of the majestic *filifera* at the Indian Canyons of Palms Springs was not only a nice sightseeing event but also very inspiring for my future interest in palms .

Welcome to Indian canyons, where you walk in the footsteps of their ancestors. Centuries ago, ancestors of the Agua Caliente Cahuilla Indians settled in Palm Springs area. They developed complex communities in the Palm, Murray, Andreas, Tahquitz and Chino canyons. With an abundant water supply, the plants, the animals and Cahuilla Indians thrived. They grew crops of melons, squash, beans and corn. They gathered plants and seeds for food, medicines and baskets weaving. Today, remains the of Cahuilla society like rock art, house pits, foundations, irrigation ditches, dams, reservoirs, trails and food preparation areas still exist in the canyons.

The Agua Caliente Indians were industrious and creative with a reputation of independence, integrity and peace. They believed this productive land of their ancestors would always be theirs. However, in 1876, the U.S. federal government deeded in trust to the Agua Caliente people 32,000 acres for their homeland. At the same time , they gave the Southern California Railroad 10 miles of odd sections of land to induce the company to build the railroad. Of the reservations 32,000 acres, some 6,700 lie within the Palm Springs city limits. The remaining sections fan out across the dessert and mountains in a checkerboard pattern. Palm Canyon is considered the world s largest California Fan Palm Oasis. Today , the Indians ' income comes mostly from the entrance fees and the Trading post sales.

Discover the desert wonders . . .

Andreas Canyon

The contrasting greens of the magnificent fan palms and more than 150 species of plants within a half-mile-radius beckon the desert-weary traveler to this lush oasis. A scenic foot trail leads through the canyon, passing the groves of stately skirted palms, unusual rock formations and the perennial Andreas Creek. In 1994 this is where we stopped first and I met my first "true" *Washingtonia filifera.*

Palm Canyon

15 miles long, Palm Canyon is one of the area of great beauty in Western North America. Its' indigenous flora and fauna, which the Cahuilla people expertly used, and the abundant *Washingtonia filfera* are breathtaking contrast to the stark, rocky gorges of barren desert land beyond and above.

Washingtonis filifera

A true relic of a past world, *Washingtonia filifera* some 30 millions years ago were certainly covering a quite large area of western America further north. Glaciations and desertification have with time confined hem to the mildest areas of the Southwest as well gullies,stream beds and hill springs, the true picture of Palm Canyon.

How many are left? I would guess about 15,000 adult palms and quite a number of seedlings and juveniles. In fact,this January 2010 I have noticed a far greater number of seedlings, small plantlets and young palms than ever before. There must have been higher rainfalls these past years. In any event it is a good sign of the vigor of *Washingtonia filifera.*

Majestic they are, beautiful with their skirts of dead fronds. Walking up the canyon among them is like locking back in time to the dawning of *Homo sapiens* on this troubled planet. As a bonus, the versatile constitution of *Washingtonia filifera* has allowed it to be cultivated over a great part of the world with preference to sunny, dry, Mediterranean climates. On the other hand it does not appreciate the hot, humid tropical climates and it is almost absent from southern Florida. *Washingtonia filifera* is moderately cold resistant and temperatures in the mid teens will kill it outright. Although drought resistant once established, *Washingtonia filifera* will grow much faster if properly watered and fed.

Its stature, size and girth may become a problem in smaller gardens. Its large crown and the sturdy tomentum free petioles armed with fierce spines will always be awesome as well as the rattle snake-like sound of the fronds shivering in the breeze.

For some unknown reasons I have not been lucky with my plantings. The two small seedlings I brought back from my November 1994 trip they never grew impressively and eventually died some ten years later from bud rot. I am left with one seedling that I brought back from a January 1996 trip. The palm looks healthy so far but the growth has been only moderate. Some growers have been more successful, including a good friend whose palms just a few years from seed are already impressive. Well, to tell the truth, this *W. filifera* is sitting on the septic tank and French cooking still has good reputation!! Quite surprisingly, along the palm-lined streets of Los Angeles, *Washingtonia filifera* is barely present, being far outnumbered by its relative *Washingtonia robusta* or "Sky duster" that seem present everywhere.

Viewing Palms in the Western Mediterranean

Article and photos by William Tang
65 Corydon Dr.
Miami Springs, FL 33166
wlmtang@bellsouth.net

I recently took a vacation to the western Mediterranean and had the chance to view wild palms in this region. I will begin my narration in Morocco and move north into Europe. My story starts in arid central Morocco in the city of Marrakech (also spelled Marakesh). Founded in the 11th century, Marrakech is a gateway to the old caravan route into the Sahara Desert. In the desert surrounding the city tall date palms, *Phoenix dactylifera*, can be seen in considerable numbers. These grow in clumps, presumably around natural oases (inside front cover). These trees do not appear to be actively cultivated and many were dead or dying from drought during my visit. Although in a semi-wild state, these trees may not be native to the area. It is possible that seeds were brought along the caravan trails by the native Berber people and have become established here. To the south of Marrakech, running east west is the High Atlas, North Africa's highest mountain range with snow-capped peaks up to 4,167 meters (13,671 feet). If we travel 40 km south from Marrakech we leave the desert and enter the greener foothills of the High Atlas. Among these foothills is the Ourika Valley, a common destination for tourist daytrips. Located some 200 km from the Atlantic Ocean, this valley has a climate somewhere between arid and Mediterranean. We see familiar temperate vegetation such as poplars and willows along streams. Here the European fan palm, *Chamerops humilis*, is found in large numbers. The palms here are short and no tall trunks were seen (Fig. 1). Domesticated goats and sheep are raised by the local people and it is possible that they feed on the palms and stunt their growth.

Moving northwest out of Marrakech toward Beni Mellal we rise out of the desert and enter the foothills of another mountain range, the Middle Atlas. The Middle

Atlas Mountains run diagonally from southwest to northeast toward the direction of the Mediterranean coast. Beni Mellal is located on the southern slopes of the Middle Atlas. At an elevation of about 500 m the climate is semi-arid and citrus and olives are common agricultural crops. Here again we find *Chamaerops* growing wild. In this city, at the Hotel Chems, I saw an unusual branching phoenix palm growing on the grounds (Fig. 2). Continuing up the Middle Atlas we reach the city of Ifrane at 1600 m. The City of Ifrane is known as the "Switzerland of Morocco". It has a cosmopolitan feel with a climate similar to Switzerland's and experiences heavy snows in the winter. There are no palms here. Descending the northern slopes of the Middle Atlas we again encountered *Chamaerops* in large numbers. Most plants viewed from the road were low growing. In some places, especially on steeper slopes and rocky outcrops, where there is no dense tree cover, this palm may be very numerous and form the main component of the vegetation (Fig. 3). Cedar, pine and oak are common trees in this area. The Atlas mountain ranges formed near the junction of the African and European tectonic plates, which collided during the Tertiary Period (65 to 2.5 million years ago). Not surprisingly the animal life here is a mixture of European and African fauna. Fox, deer and bear once coexisted with macaque, gazelle, leopard and lion. The lions and bears of the Atlas were once captured by the ancient Romans for use in gladiatorial games. Nowadays the Atlas lion is extinct in the wild, the last one was shot in the 1920's, and the Atlas bear is very rare. The soils in the northern slopes of

Figure 1 -. Chamaerops humilis in the Ourika valley, Morocco; note the silvery leaves.

Figure 2 - A phoenix palm with multiple branches cultivated at Beni Mellal.

Figure 3 - Numerous Chamaerops growing on a rocky hill slope; northern slopes of the Middle Atlas Mountains.

the Middle Atlas are stony, and apples are a common crop here. Goats and cattle are also raised here in large numbers and my guide, a former economics professor, explained that many inhabitants still live a semi-nomadic life, moving their herds in seasonal pattern to take advantage of available forage.

Next we travel westward, down from the Middle atlas toward the Atlantic coast, past the city of Fez, with its amazing medieval marketplace. When we reach the coast we see mostly farmland. The Altantic coastal plains have a Mediterranean climate and rich soils and have been cultivated for millennia. Even here, *Chamaerops* can be seen occasionally in disturbed vegetation (Fig. 4). *Chamaerops* is also seen in cities as an ornamental (Fig. 5). Finally we reach Tangiers, near the Straits of Gibraltar, where the ferry takes us to Spain.

Across the straits our ferry lands in Tarifa, Spain. Above Tarifa there are wind farms. Undoubtedly the straits form a natural wind funnel and breezes are strong and persistent. The vegetation here is a type of Mediterranean scrub with *Chamaerops* being a common component. Moving north inland into the Iberian Peninsula, the European fan palm can be seen growing wild as far north as Seville, where it occurs in oak woodland. Famous for its orange trees, Seville has a subtropical climate - only 11 frosts were recorded in the 20th century and the last snow occurred in 1808. Besides citrus, olive, grape, cotton, sugarcane, beet and wheat are grown in the region. East of Gibraltar is the Costa del Sol, a growing resort and retirement area for sun starved

Figure 4 - Chamaerops growing near cultivated fields at Moulay Bousselham, on the Atlantic coast of Morocco.

Figure 5 - European fan palm cultivated at the Mausoleum of Mohamad V in Rabat, the Capitol of Morocco.

Figure 6 - Wild Chamaerops in the Costa del Sol, Spain.

northern Europeans. Large areas of the coast have been cleared, but *Chamaerops* can still be seen in reasonable numbers (Fig. 6). The vegetation here is subject to a 5-6 year drought cycle and I saw charred, but living stems of this palm in areas that recently burned. The palm becomes less and less common further inland as the vegetation turns into oak woodland and altitude rises.

The European fan palm is said to occur all along the Mediterranean coast of Iberia extending just into France. Although I did not explore this portion of the range north of Costa del Sol I did fly out to the island of Majorca. Majorca is situated off the eastern coast of Spain and is the largest of the Balearic Islands. The northwest side of the islands is mountainous and along the northwest coast the European fan palm occurs abundantly in patches, along the beach as well as the rocky cliffs (Figs. 7, 8 and front cover). This area does experience cold winter weather with temperatures dipping down to -6 °C.

Of course, the European fan palm is a popular ornamental throughout the Mediterranean coasts of Western Europe (Fig. 9) and is a favorite landscape plant in much of Florida and California. I hope my travel pictures give the reader some idea of the wide range of conditions that the plant can grow in and that there are probably many natural varieties, many of which have not yet been fully exploited for cultivation.


Fig. 9


Fig. 8


Fig. 7

Figure 7 - Chamaerops in Mediterranean scrub under pine along Fomentor Beach, Majorca.

Figure 8 - A clump of tall Chamaerops on cliffs near Fomentor, Majorca.

Figure 9 - Fruiting European fan palm cultivated in Avignon, near the