

# Lompoc Valley Botanic and Horticultural Society

Founded June 5, 1977

## *Looking at and Listening to a Plant* by Julie Leafy



Palms in Mexico  
Photo Julie Levy

Ah, Mexico! As I floated on an oversize inner tube down the slow-flowing lazy river at my luxurious time-share resort, I looked up dreamily at the palm tree fronds gently swaying above me in the balmy breeze.

But wait a moment! Did I just mention “palm trees”? Not so fast! I stand (or float) corrected. Those palms are grasses, not trees! So, let’s continue with the story.

**Looking:** Imagine looking at a grass that towers 200

feet tall. Or imagine seeing a grass that sprouted from a seed 2000 years old. (The former is a wax palm; the latter is a date palm.) The palm family has around 2600 species and 181 genera. The palm plant is a genius at diversification.

Why are we calling it a grass, you may well ask. It’s not in the grass family (Poaceae), which includes tall, sturdy bamboos; pasture and lawn grasses; and cereal grains like corn, which on a beautiful day

“is as high as an elephant’s eye”. This grass, the palm, which often looks like trees, is in its own palm family (Arecaceae). That being said, both families are truly in the major group of flowering plants called Monocot, and within that group they are in the grass CLASS, and the nitty-gritty reason that palm isn’t a tree is because it does not have a bark. (Arf-arf!)

About the defining differ-

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Melaleuca in the Drought  
Tolerant Garden  
Photo Mimi Erland

## *Meeting January 21<sup>st</sup>, 2:00*

### **How Plants Use Chemicals to Defend Themselves**

Dr. Helga George is a plant scientist and writer, who specializes in explaining biology so that non-scientists can understand it. She will be giving a talk on how plants use chemi-

cals to defend themselves against pathogens, pests, predators – and even other plants.

In addition to giving an overview of this field for laymen, she will briefly discuss her doctoral research on how fungal pathogens detoxify an antibiotic from pea plants.

Feel free to extend an invitation to your friends and neighbors to join our Society and to attend our events as a guest.

Refreshments provided.

Stone Pine Hall  
210 South H Street  
Lompoc, CA  
2:00 p.m.

## GMOs in Food *by Helga George, PhD*

The term GMO stands for “genetically modified organism” and strikes fear into many people’s hearts. However, the technology is neutral and can be used for good or evil – depending on what gene is introduced.

GMOs are widely used in agriculture, but many consumers emphatically oppose their use. The World Health Organization says that “it is not possible to generalize about the safety of GM crops” and that they should be taken on a case by case basis.

### **GMO technology occurs in nature**

Despite the widespread perception that GMOs are monstrosities created by humans, this process actually occurs in nature. There is a disease of plants called crown gall where apple trees and many other types of plants develop tumors or galls on their bark following infection with the bacteria *Agrobacterium tumefaciens*.

Bacteria can transfer DNA as circles known as *plasmids*. These bacteria produce plasmids that contain genes that cause the tumors and ones that produce chemicals that the bacteria feed on in their new host. These plasmids are called *T-DNA*, short for transfer DNA. The bacteria

colonize the plants through a wound site and then transfer this plasmid into the DNA of plants that they have infected.

### **How genes are introduced to plants**

This natural ability has been harnessed in the lab to create genetically engineered plants known as *transgenic* plants. The plasmids are genetically engineered to remove the genes for tumors. They are then modified to contain a desirable gene, and they have two extra genes for antibiotic resistance. One is used to tell whether the bacteria contain this plasmid, and the other is used to detect whether the plasmid has successfully been integrated into the plant’s DNA.

Not all plants are susceptible to crown gall disease. Corn is the primary example of one that is not and requires a different strategy for genetic engineering. Brute force is used to introduce genes into these plants. They are shot with miniature pellets of DNA! Strange, but true.

### **Are GMOs in foods dangerous?**

There is a large disconnect between scientists and the general public on whether GM food is safe to eat. An extensive survey by the

Pew Research Center in 2014 clearly demonstrated this. They found that while 88% of scientists agreed that these foods were safe to eat, only 37% of American consumers agreed. That is a difference of 50%! What I find even more distressing is that only a minority of Americans think that scientists thoroughly understand the health risks and benefits of food made from GM crops.

There are several reasons for the widespread opposition to GMOs. First, is the fear of causing changes to our food that could be dangerous. However, I and most plant scientists, consider the use of GMO technology to be much safer. It involves changing one gene that has been widely studied.

### **Accidental poisoning from crops developed by traditional plant breeding**

When you breed a new variety of a plant in the traditional manner, you are shuffling around thousands of genes – with the potential for accidental changes. Plants make many different chemicals to defend themselves from insects and pathogens. Many of these chemicals are toxic to humans. I will go into this in my upcoming talk.

There have been several

high-profile cases of accidental poisoning in the US in recent years caused by new varieties of food that were developed by conventional plant breeding. In one case, many people who ate a new type of celery developed rashes when they were in the sun. That turned out to be because the new variety of celery had higher concentrations of a chemical called psoralen that causes sensitivity to light.

Another example was a new variety of potato that cost hundreds of millions of dollars to create and inadvertently poisoned the people who ate it. Potatoes are in the nightshade family as are tomatoes, eggplants, and peppers, and they all produce the poison solanine. You can avoid this toxin in potatoes by cutting off any green parts. However, there have been many tragic cases of deaths from solanine that are discussed in a Smithsonian article linked below.

### **RoundUp Ready crops**

When many people think of GM technology and food, they think of crops that have been genetically engineered to tolerate the herbicide RoundUp (glyphosate). They are called *RoundUp Ready* plants and can survive be-

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## GMOs *(Continued)*

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ing sprayed with glyphosate.

Glyphosate affects plants by inactivating an enzyme that is only found in plants and some bacteria – not in humans. Scientists had identified bacteria that are resistant to RoundUp because they produce a slightly different enzyme. They replaced the plant's native enzyme with the bacterial one. This produced transgenic plants that are no longer sensitive to RoundUp.

This means that farmers no longer need to carefully avoid spraying their crops and can spray their whole fields with RoundUp. A downside of this is that the crops produced in this manner are much more likely to contain glyphosate,

and understandably, not everyone wants to eat food that contains higher amounts of herbicide.

Ironically, RoundUp came to prominence because it is one of the less toxic herbicides. However, there has been a huge debate as to whether it causes cancer. That is a hard thing to prove (think of how many decades it took to prove that cigarettes cause cancer). People have won lawsuits for cancer they attributed to the use of RoundUp.

### **Resistance to insects and pathogens**

Many GMOs have enhanced resistance to protect them from pests and plant pathogens. A key example of this is the group of BT GMOs that express an insecticidal toxin from bacteria that are used in

organic farming and gardening. Look for more information on this in a future article.

### **Links**

Pew Research Center survey

<https://www.pewresearch.org/science/2016/12/01/public-opinion-about-genetically-modified-foods-and-trust-in-scientists-connected-with-these-foods/>

Horrific Tales of Potatoes that Caused Mass Sickness and Even Death

<https://www.smithsonianmag.com/arts-culture/horrific-tales-of-potatoes-that-caused-mass-sickness-and-even-death-3162870/>

Helga George, PhD (not funded by any agricultural companies)



Crown Gall of Rose

Who would have thought that this weird growth would be the inspiration for an entire field of new-age plant breeding.

*Photo*

244673144 © HooverStudio  
Dreamstime.com

## *Refuge from the Cold* by Mimi Erland

In early December, Eric and I visited our daughter in Maryland. She toured us around royally. As well as seeing the Gettysburg battlefield and the Smithsonian Natural History Museum, we went to the United States Botanic Garden. Wind was whipping across

the Potomac and tiny hail was pelting us as we hiked the long blocks of downtown Washington DC. The two-story glass conservatory was like a beacon, welcoming us in from the wintry weather.

The greenhouses in the

garden are divided into separate rooms, each with their own heating, cooling, and humidity controls to mimic various temperate and tropical areas of the world. Plants were flowing from rafters and tucked into rock crevices next to

*(Continued on page 6)*





## ... *Listening to a Plant* cont.



*Crescentia alata* above, and  
a maraca made from the  
dried fruit below  
Photos Julie Levy



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ence between trees and grasses, Wikipedia can provide a deeper understanding of barks much better than I can, so I quote it here. You might have to read it twice to get it, in all its splendor: “Like all monocots, palms do not have the ability to increase the width of a stem (secondary growth) via the same kind of vascular cambium found in non-monocot woody plants. This explains the cylindrical shape of the trunk (almost constant diameter) that is often seen in palms, unlike in ring-forming trees.” Wiki also states, “Most palms are distinguished by their large, compound, ever-green leaves, known as fronds, arranged at the top of an unbranched stem.” (source is <https://en.wikipedia.org/wiki/Arecaceae>)

Arecaceae)

Now we will leave the topic of tall PALM and move onward and upward.

**Listening:** Now, let’s shake rattle and roll for the New Year of 2024, with happy wishes for Dancing and Playing – with a Maraca, a musical instrument that often is made from gourds – but also is made from fruits of a “gourd” tree. Such a tree is a dicotyledonous plant of the genus *Crescentia*, native to the Americas. One species, *C. alata*, caught my eye at the Vallarta Botanical Garden near Puerto Vallarta. What a curious looking plant it is. The fruits grow directly from nodes on the trunk and branches. It’s interesting how the fruits can be seen in all stages of growth at the same time, from several babies around an inch wide to the biggest ones around 10 inches in diame-

ter. Another curiosity: It is said that dispersal is only by horses stomping on it, or humans – the woody shell is that hard to crack! Another species, *C. cujete*, is commonly called “the Calabash tree”, sharing its name with the vine calabash (bottle gourd), and its fruit is hollowed out to make serving dishes such as cups, bowls, and canteens; or made into rhythmic rattles for ceremonies in many places in the world.

So how do you make a maraca from a tree gourd? Of course you can’t just uproot a 25 foot tree and shake it to make it rattle. In Mexico at the souvenir shops, you can test the sound of many a painted ready-made maraca. You can also see cups and bowls and lanterns made from coconut shells, *Crescentia* fruits, and calabash gourds.



## *Garden Quotes* (and photo) submitted by Julie Levy

*“If you will stay close to nature, to its simplicity, to the small things hardly noticeable, those things can unexpectedly become great and immeasurable.”*

— Rainer Maria Rilke

*“Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts. There is something infinitely healing in the repeated refrains of nature — the assurance that dawn comes after night, and spring after winter.”*

— Rachel Carson

## Gardener's Bulletin Board

**-Announcement from the California Garden Clubs:** The Red Bluff Garden Club is hosting a "Flower Show School," in March 2024. The school provides training for future judges. If

you are interested, contact Dottie Renstrom, FSS Chairman to receive materials describing this two day training. .  
tdrenstrom@yahoo.com  
530-736-0608

- Carol Redhead is happy to share her garden to-do list for January. There wasn't space in this newsletter issue for it. Please email her at redheadcarol36@gmail.com



*Salix lasiolepis*

## Membership Meeting Minutes from November 19th, 2023

The meeting was called to order by Mimi Erland at 2:07 p.m.

### Business

Minutes from September 17, 2023 filed as written.

Treasurer's report:

Our opening balance as of Aug 31 (as reported on the date of our last general meeting) was \$16,175.36. Since then, our debits: - \$49.03 (Sept. newsletter printing + refreshments purchase); credits: \$6.00 (membership dues). As of Oct 31, our closing balance was \$16,132.33. Petty cash balance was \$10.00.

### Committee Reports

Communications

Newsletter - Mimi Erland requested articles. Also there was a discussion about the high cost of the newsletter. It's \$53 to send out 10.

Publications - Charlie Blair mentioned History of Flowers and the Chaparral CD and the book Acres of Loveliness.

Publicity & Social Media - No report.

Website - Julie Levy stated she had been shown the bells and whistles on the website.

Botany - No report.

Education - Christine Zuhlsdorf stated she had nothing to report.

Horticulture - Mimi Erland reported on the Make a Difference Day event.

Membership - Helga George stated she looked forward to serving.

### New Business:

Nominations for January election of officers. Helga George and Christine Zuhlsdorf offered to serve as the Nominating Committee. Helga did a quick survey of who would get the votes.

President, Vice President, Secretary, Treasurer

Kristin stated that 3rd District Santa Barbara County Supervisor Joan Hartmann had mentioned that the Santa Barbara Botanic Garden had grants to give.

Helga stated that the May meeting will be at the Windmill Nursery in Buellton.

### Announcements

The next garden care day is Feb 3 at the Burton Mesa Chaparral Garden from 9:00 to 12:00.

The Red Bluff Garden Club is hosting a "Flower Show School" next March 2024. The school provides training for future judges. If interested, contact Mimi Erland for further information.

The next LVBHS membership meeting is on January 21, 2024, at Stone Pine Hall. There will be elections of officers and a presentation by member Helga George.

Member Al Thompson is in Ohio and doing well at 92.

Adjourned business portion of meeting at 2:25 p.m.

Plant and Seed Exchange

Submitted by Kristin Worthley, Secretary

### Garden Care Day

Saturday, February 3rd 9:00-12:00 will be our next garden care day at the Burton Mesa Chaparral garden. Bring pruners, a rake, a shovel and a large bucket or wheelbarrow if you can. We will be trimming along the paths and digging out invasive African veldt grass.



Shagbark Manzanita  
*Arctostaphylos rufis*



## Lompoc Valley Botanic and Horticultural Society

LVBHS

C/O Carl Jones—Treasurer

416 North C Street

Lompoc, CA 93436

### **BOARD MEMBERS:**

#### **President**

Mimi Erland 315-7105

#### **Vice President**

Patcine Beaman 588-7498

#### **Secretary**

Kristin Worthley 909-855-9786

#### **Treasurer**

Carl Jones rayjones267@yahoo.com

#### **At Large Representatives:**

Elena Jones 450-3668

Bonnie Bigelow 717-0960

Mark Zuhlsdorf

mzrelatingtoplants@gmail.com

### **COMMITTEES:**

#### **Botany/Chaparral Garden**

Elena Jones 450-3668

Charlie Blair 717-0067

Allyssa Imano 588-7598

#### **Horticultural/Drought Tol. Garden**

Mimi Erland 315-7105

Joe Goetz 405/707-8005

#### **Education**

Christine Zuhlsdorf

czrelating2plants@gmail.com

#### **History**

Need volunteer

#### **Membership**

Helga George 705-6857

### **COMMUNICATIONS:**

#### **Communications Chair; Publicity & Social Media**

Elena Jones edavey@hotmail.com

#### **Books and DVDs**

Charlie Blair blaircharles491@yahoo.com

#### **Newsletter**

Mimi Erland mimierland1@gmail.com

Helga George 705-6857

#### **Website**

Julie Levy lvbothortsoc@gmail.com

## *Refuge, cont.*

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realistic looking streams and ponds. Palms reached the ceilings and flowers were everywhere. I was surprised to notice that each section smelled differently. Some smelled like orchids; some smelled like mushrooms and damp soil, and one had a faint odor of carrion flowers (stinky). I enjoyed reading all the labels and finding out where each plant came from. It was the best place to spend a chilly morning.



US Botanic Garden

Photo Mimi Erland