S.F.V.B.S.

SAN FERNANDO VALLEY BROMELIAD SOCIETY

OCTOBER 2017

P.O. BOX 16561, ENCINO, CA 91416-6561
sfvbromeliad.homestead.com sanfernandovalleybs@groups.facebook.com

Elected OFFICERS & Volunteers

Pres: **Bryan Chan & Carole Scott** V.P.: **John Martinez** Secy: **Leni Koska** Treas: **Mary Chan** Membership: **Joyce Schumann**
Advisors/Directors: **Steve Ball, Bryan Chan, Richard Kaz –fp** Sunshine Chair: **Georgia Roiz,**
Refreshments: **vacant** Facebook: **vacant** Web: **Mike Wisnev,** Editors: **Mike Wisnev & Mary K.,** Snail Mail: **Nancy P-Hapke**

next meeting: **Saturday October 7, 2017 @ 10:00 am**

Sepulveda Garden Center 16633 Magnolia Blvd. Encino, California 91316

AGENDA

9:30 – ***SET UP & SOCIALIZE***

10:00 - *Door Prize – one member who arrives before 10:00 gets a Bromeliad*

10:05 -Welcome Visitors and New Members. Make announcements and Introduce Speaker

10:15 –*Speaker* ***Nels Christianson***

"Bromeliads of Central and Eastern Brazil"


Nels Christianson 6-11-11

Nels loves photography and really knows his subject matter. He loves plants and has a collection of more than 500 Bromeliads, cacti and succulents staged and growing in his own pottery. Traveling to Latin America more than 25 times he has become fluent in Spanish and Portuguese as well as English and a little French. At home in the USA he studied Political Sci., Hispanic Civilization, and Latin American Studies. He also studied Brazilian literature at a university in Brazil. In his spare time he judges poetry and several of his poems about nature have been published. **Don't miss this meeting!** <>

See "Interesting fact about ***Brazil on page 3***

11:15 - Refreshment Break and Show and Tell: Will the following members please provide refreshments this month: ***David Bassani, Ron Behar, Kaz Benadom, Jeanette Bond, Pat Byrne, Mary Chan and anyone else who has a snack they would like to share.*** If you can't contribute this month don't stay away…. just bring a snack next time you come.

Feed The Kitty

If you don't contribute to the refreshment table, please make a small donation to **(feed the kitty jar)** on the table; this helps fund the coffee breaks.

11:30 - Show and Tell *is our educational part of the meeting* – Members are encouraged to bring one or more plants. You may not have a pristine plant but you certainly have a question about one.

11:45 – Mini Auction: members can donate plants for auction, or can get 75% of proceeds, with the remainder to the Club

12:00 – Raffle: Please bring plants to donate and/or buy tickets. Almost everyone goes home with new treasures!

12:15 – Help us, **Pick Up around your area**

12:30 –/ **Meeting is over**—Drive safely

Mary k is taking a look back at the September meeting……..

We had a great meeting. Cristy Brenner is a great speaker and photographer with a fantastic presentation. Great food donations from *Maryk, Mohamed El-Tawansy, Barbara Wynn, Bob Wright, Tom Lucero, Ana Wisnev, Wendie Fisher, Nancy P-Hapke, Cristy Brenner and Tetsuya*, our visitor from Japan. Show-n-Tell plants were brought in by *Peter Spezaile, Maryk, Mohamed El-Tawansy, Leni Koska, Bob Wright, Mike Wisnev, Ray VanVeen and Nancy*. The Raffle plants were provided by *Peter Spezaile, Leni, Bassani, Tom Lucero, Georgia Roiz, Nancy and Maryk* and we had a large donation of plants from Alan Levy, a member of the LaBallona Bromeliad Society. *Bob Wright* gave a brief recap of his BSI conference visit to Florida. The backyard picnic and holiday brunch were discussed. If anyone is interested in the Bromeliad Bus trip on Oct 28 you can contact MaryK at rango676@aol.com or 818-705-4728. <>

***Announcements*:**

- ***Auction Plants –*** At the October meeting we will have auction plants from Bob Friedman's collection

- ***Library*** - Just a reminder that SFVBS has a small but useful Library of past issues of the "***Journal of the Bromeliad Society***" published by the **Bromeliad Society International** (BSI). The latest issue has articles on the 2018 Conference, A New Dyckia, Bromeliad Systematics, and a Pretoria Garden Tour, plus others with titles too long to list here. See Joyce at the membership table to check out an issue. Check it out one month, bring it back the next. See you at the next meeting. – Joyce Schumann

- ***SFVBS Backyard Picnic*** - Saturday, October 14th. at the home of Mary and Bryan Chan, 10571 Odessa Ave., Granada Hills. Everybody is welcome to arrive as early as 3pm and we plan to eat around 5pm. This is a potluck event. We are thinking about incorporating live music as well. Please RSVP as soon as possible, so that we can have an idea on how many to expect. Bcbrome@aol.com or (818) 366-1858.

- ***Participation Rewards System –*** This is a reminder that you will be rewarded for participation. Bring a Show-N- Tell plant, raffle plants, and Refreshments and you will be rewarded with a Raffle ticket for each category. <>

Membership Dues

NEED TO RENEW for 2018?.....

Pay at the meeting to: Membership Chair – Joyce Schumann or Treasurer - Mary Chan
or Mail to: SFVBS membership, P.O. Box 16561 - Encino, CA 91416-6561
***Yearly Membership* Dues** **$10.00** for monthly e-mail newsletters or **$15.00** for snail mail

Please Put These Dates on Your Calendar

Here is our 2017 Calendar. As our schedule is always subject to change due to ……, please review our website and email notices before making your plans for these dates.

Saturday November 4	Pam Koide
Saturday December 2	Holiday Brunch
Saturday January 6, 2018	***STBA***
Saturday February 3, 2018	***STBA***
Saturday March 3, 2018	***STBA***
Saturday April 7, 2018	***STBA***
Saturday May 5, 2018	***STBA***

STBA = Speaker To Be Announced

Speakers Let us know if you have any ideas for Speakers about Bromeliads or any similar topics? We are always looking for an interesting speaker. If you hear of someone, please notify John Martinez **johnwm6425@gmail.com or Bryan Chan bcbrome@aol.com** <>

Interesting Facts About Brazil

Brazil is world famous for it's penchant for football and the Rio De Janerio beaches. However, the main land characteristic of Brazil is the extensive Amazon Rainforest in the north and the hilly and low mountainous region in the south. Most of the agricultural population of Brazil, as well as the agricultural base is in the south.

Brazil is the largest country in Latin America. It is the fifth largest country in the world, in terms of area as well as population. It has a total territory of about 8,514,876.599 square kilometers. The coastline of the country is about seven thousand three hundred and sixty seven (7367) km to the east.

Other than these, many archipelagos - cluster of islands - come under the territory of Brazil. The entire Atlantic coast is home to several mountain ranges, some reaching up to nine thousand five hundred (9500) feet in height.

The chief rivers in Brazil are the Amazon, Parana, Igacu and the Negro, Xingu, Madeira, Tapajos and Sao Franciso rivers. To the south, it is bordered by Uruguay, Argentina and Paraguay. It is bound by Peru and Bolivia to the west. It is bound by Colombia to the northwest.

Brazil has been a Colony, an Empire, a Republic and has been under the Military rule. It is today a democratic nation. The capital of Brazil is Brasilia. It is a presidential representative democratic republic according to the constitution of 1988. The north of Brazil is about forty five percent of the total surface of Brazil. However, it is the region with the least population and is basically an under developed and under industrialized zone. The areas of Manaus and Belem are developed places and house a tax free industrial zone and are the biggest metropolitan area in the region respectively. The North East area has about one third of Brazil's total population. This region is the poorest region in Brazil. The important cities in the Northeast area are the Salvador, Fortaleza and Recife.

The richest regions in Brazil are the Southeast areas. These areas are also more populated than any others in Brazil. This area has more inhabitants than any country in South America. It is home to one of the largest mega polis in the entire world. The biggest cities in this area are Rio de Janeiro and Sao Paolo. Sao Paolo is the business center of this area. Rio de Janeiro is famous for its beaches and the Espirito Santo coast. <>

Member photos ….. Mike stumbled across this at the Huntington a couple months ago – stunning. It is *Tillandsia reuteri*., first found by Prof. Rauh in 1970 and later described by him. It grows in the mountains in northern Peru.

Tillandsia reuteri

Below is *Vriesea gigantea*. I kept waiting for the flowers to open, and they never did. I wondered if they were nocturnal and checked at midnight and still no joy. Mike emailed Derek Butcher, who suggest 2 a. m. He was right!

Vriesea gigantean

Taxonomic Tidbits – *Pollen – Part 1*

By Mike Wisnev (mwisnev@gmail.com)

San Fernando Valley Bromeliad Society Newsletter –October 2017

What is pollen? That is, besides the fact it gives a lot of us hay fever in the spring. The first part of this article is about pollen and plant reproduction, and thus really isn't taxonomy, which is the science of classification. Instead it is basic botany, and most of it applies to all flowering plants. The second part of this article is about the role pollen plays in taxonomy.

Pollen Basics.

This article will only provide the basics, hopefully some of interest. Any college level textbook will have a lot more, maybe even an entire chapter. Almost everything in this section of the article is taken from a few pages of the third edition of a 2003 college textbook called "Botany - An Introduction into Plant Biology" by Professor James Mauseth, who is also a cactus and succulent expert.

Pollen is sort of like the plant equivalent of sperm. But that isn't really accurate – it is arguably more complex. Technically, pollen is a spore and it produces sperm. Pollen is pretty small – we are barely able to see a single pollen grain. Here is one blown up.

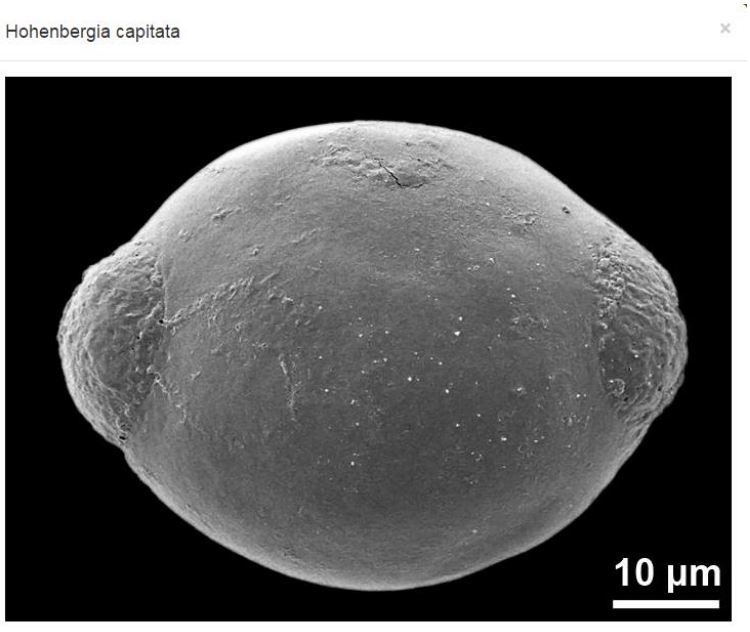


Photo by **Dr. Heidemarie Halbritter**

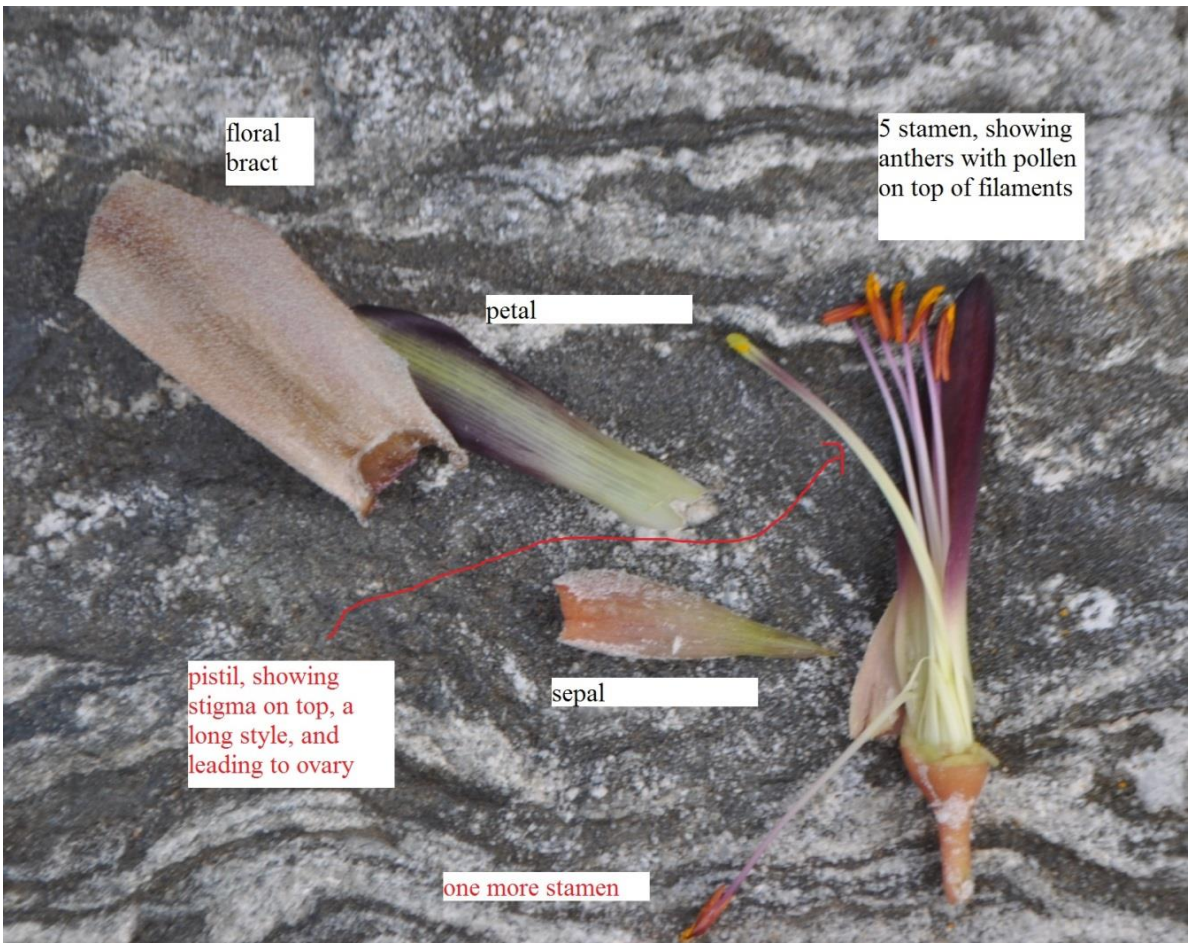
Not much to it, is there? It just seems to be a fairly smooth (psilate in pollen jargon) surface (exine) with some odd shaped ends. These two ends are pores, and it appears there are only two of them (diporate). In *Hohenbergia*, "the pollen grains are usually diporate or sometimes 3 to 6-porate, with exine often psilate." Leme in J Brom Soc 60(4): 151-157. 2010.

Unless noted otherwise, every pollen photograph in this article was taken by Dr. Heidemarie Halbritter, who is a co-author of An Illustrated Handbook of Pollen Terminology, a text that defines over 300 "widely used" (who knew?) pollen terms. That might give you a sense of how big a topic this can be for some botanists. **The pictures are found on the Palynological Database operated by the University of Vienna. https://www.paldat.org/** Amazingly, this site has over 24,000 pollen pictures of about 2800 species in over 1340 genera! The photos were taken from a scanning electron microscope.

How big are these pollen grains? You see the scale at the bottom of each picture. This shows 10µ, which means 10 microns or 10 micrometers. A micron is one –millionth of a meter. One inch is 25,400 microns. One site says 40 microns is visible to the naked eye (and 5 microns can be felt with your fingertip), so pollen grains are just bigger than the minimum size for some of us to see, although not any details.

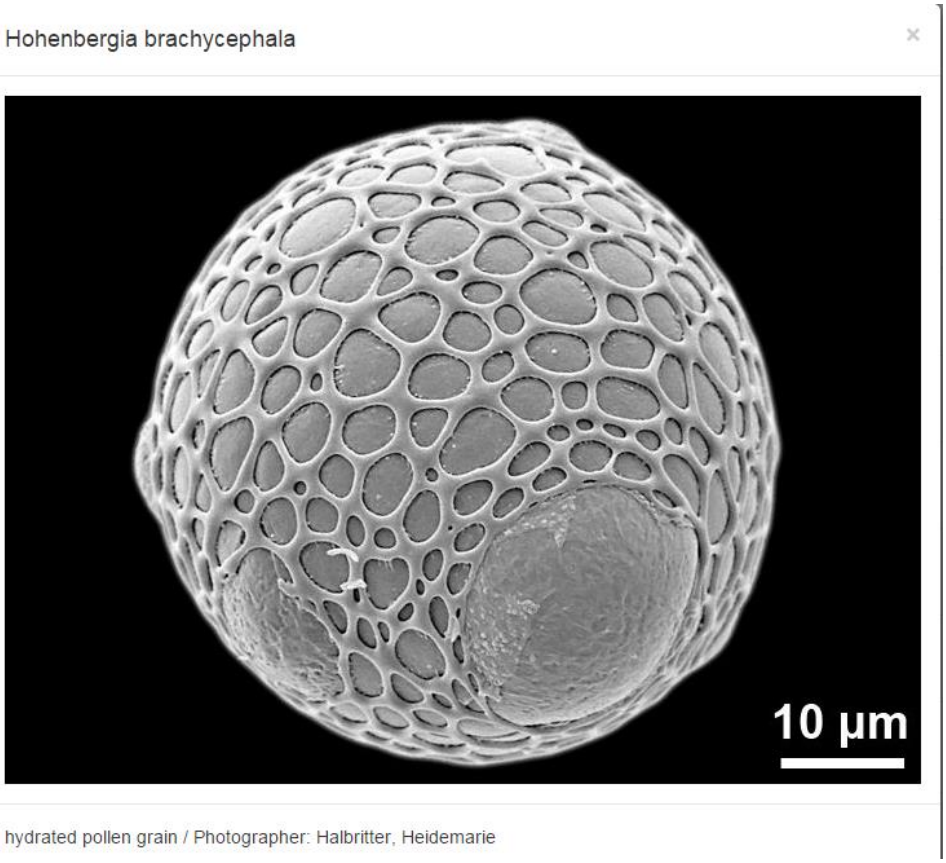
Flower parts. Pollen is created in the anthers, which is part of the stamen. Different plants have different numbers of stamen, and some flowering plants don't have any. However, almost all bromeliads have six stamens, the only exception being those species that separate male and female flowers.

Below are three pictures of *Puya stenothrysa*.


floral bract
5 stamen, showing anthers with pollen on top of filaments
petal
pistil, showing stigma on top, a long style, and leading to ovary
sepal
one more stamen

I took off a flower, and then removed most of the floral bracts, petals and sepals, all shown on the left. The remaining flower shows 7 thin long organs that would otherwise mostly be hidden by the petals. The one on the left is the pistil, the female reproductive organ, which includes the stigma at the tip, in yellow, and the long yellow white style that goes into the ovary at the bottom. There are 6 stamens, the male reproductive organs, each of which has a long filament with an anther on top (orange) with a bit of pollen at the tip in orange-yellow.

Actually, the stamens and pistils aren't male or female. Rather they are reproductive organs that produce male or female sex cells.



Here is another pollen grain. Even though this is another *Hohenbergia*, it looks very different than the one above. It has at least 4 pores and has a reticulated surface. The overall shape is also very different; this one is spheroidal and the one above is ovoid.

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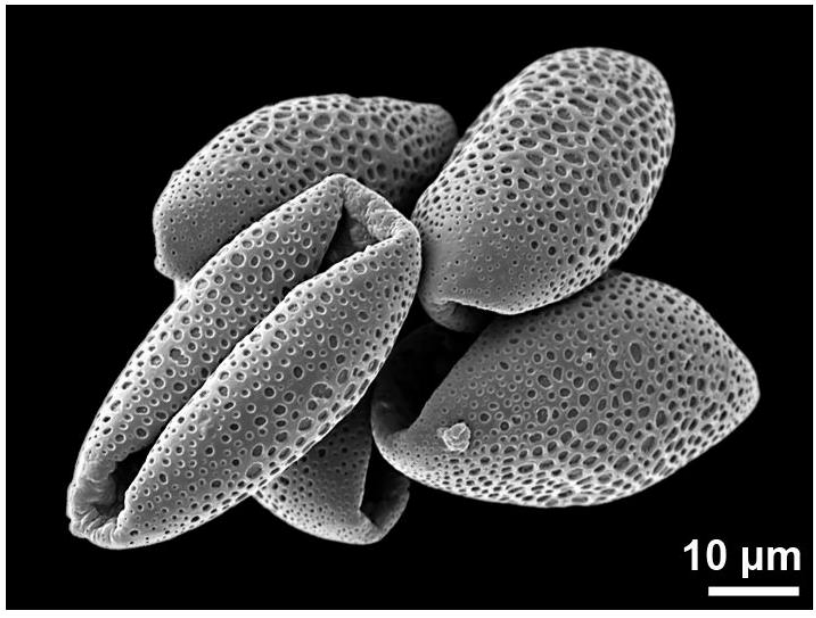
Most bromeliads have flowers with six stamens and one stigma. But some, like *Hechtia*, are more like us in that some plants are male and have flowers with stamens, but not functioning stigmas, while others are female and have flowers with stigmas but not functioning stamens.

Except for the part about bromeliads having 6 stamens, pretty much everything else in this section applies to most flowering plants. Lots of plants don't have flowers, so some of it doesn't apply to them. All bromeliad flowers have 3 petals and 3 sepals, unlike many other plants.

Meiosis. If you took biology, you might remember the terms meiosis and mitosis, and haploid and diploid. The good news is that this article isn't going to explain much about them! Each plant cell, like each human cell, has a nucleus that has pairs of chromosomes that contain DNA. Humans have 23 pairs, and plants have different numbers of pairs. In each pair, one is from the mother and one from the father – it is called a diploid cell.[1] As you or the plant grows, the cells divide and the DNA replicates itself in a process called mitosis.

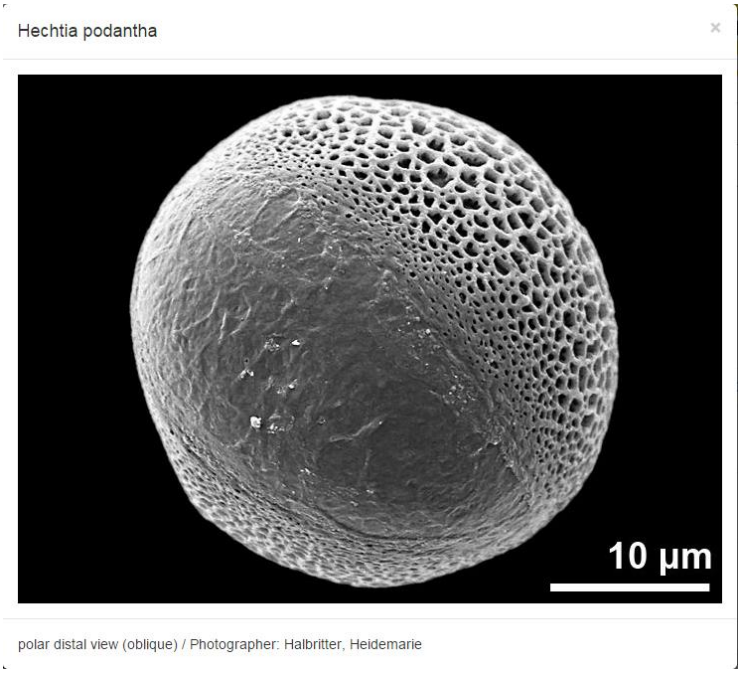
The photo of 5 pollen grains below shows that some pollen don't have pores. It also shows what happens when pollen dries up!

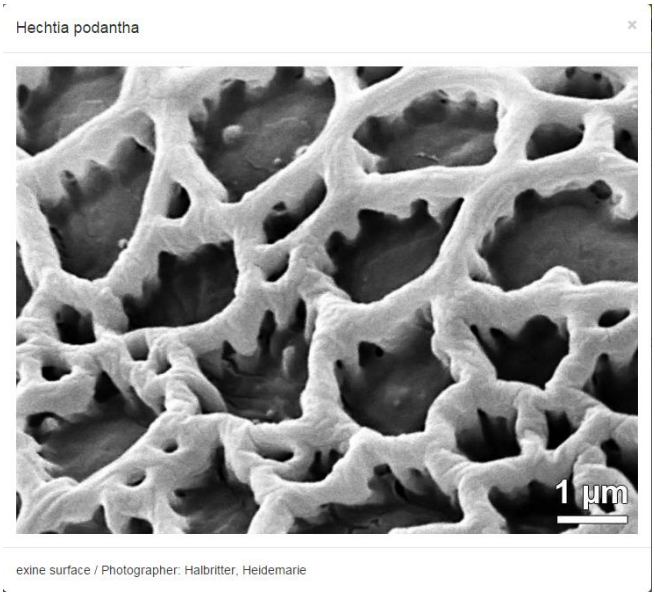


The reproductive process is different. Here each chromosome not only duplicates, but they also rearrange the strands to get different combinations of DNA and then divide so that the remaining cells have one member of the chromosome pair. This process is called meiosis. The resulting sex cells are either eggs or sperm cells, both called gametes.

[1] Actually, plants can be a lot more complicated. Many plants are be polyploid, which means that they can have more than two sets of chromosomes. This article ignores this complication.

Since gametes only one member of each pair of chromosomes, they are considered haploid. When fertilization occurs, the resulting cell is once again diploid.





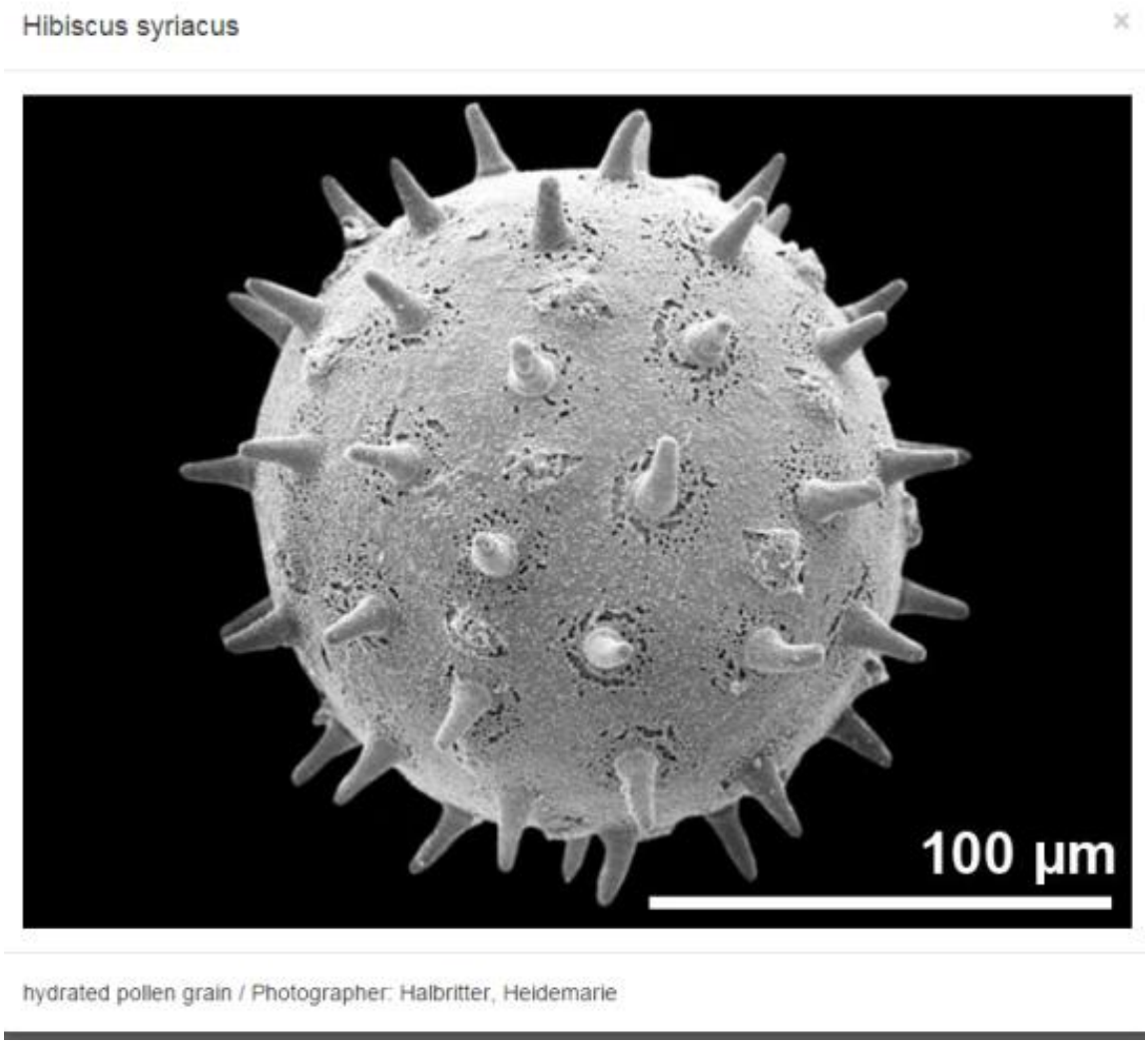
This Hechtia pollen looks a lot like the *Tillandsia* pollen – no pores. You also get to see a close up of the surface. Why does the chromosome rearrange the DNA? Basically to provide plants with different characteristics and strengthen the gene pool. If this didn't happen, we would all look like our siblings, and maybe like each other.

Misconceptions. The preceding paragraph is inaccurate in that it suggests the plant has some purpose or intent in doing all this. You often see this error since it is hard to avoid, even if you try. Cells basically engage in biochemical processes that are triggered in various ways. But there is no intent or purpose by the cell or plant. While humans and animals intend to take certain actions, this is not true for their cells – you don't have any control or purpose over whether you use mitosis or meiosis. So it is more accurate to say that an advantage of meiosis is that provides plants with different characteristics and strengthens the gene pool.

I will no doubt make this kind of inaccurate statement in many articles, and this is a blanket apology, or correction, for each of them.

Spores. Animals produce gametes, that is, sperm or eggs. In contrast, adult plants, as we think of them, produce spores. The spores in turn divide and end up as ultimately end up producing gameophytes, which in turn produce gametes - eggs and sperm. This process is explained next.

As seen above, pollen comes in different shapes and can have different features. In fact, it varies in size as well. Most of the pollen above are about 60 microns. But here is one, not a bromeliad, probably 3 times that size. It also had odd pointed structures, called echina, on its surface.



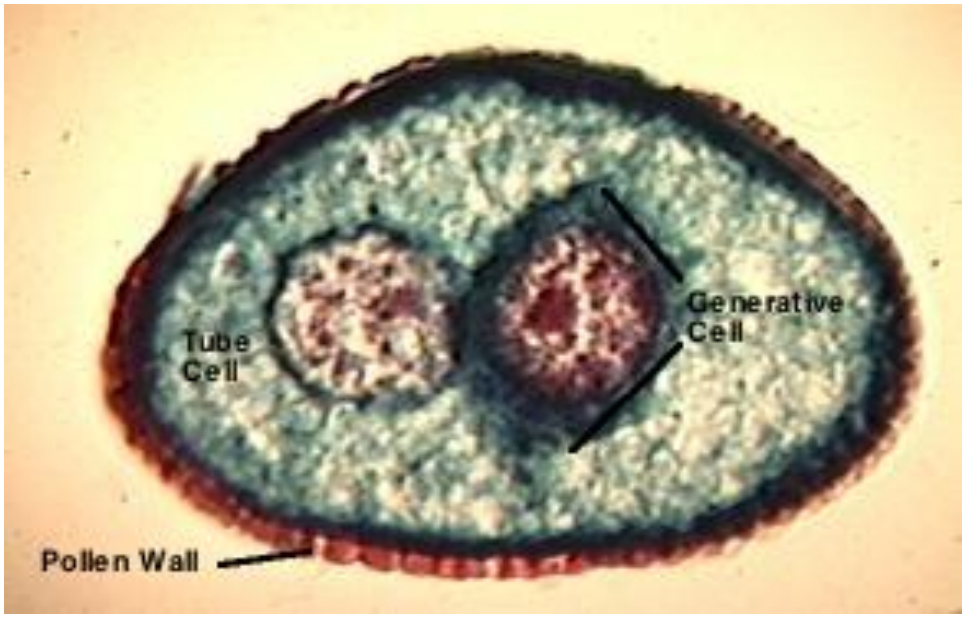
I am guessing these features make it more likely the pollen will be carried by a pollinator or stick to the stigma, but don't really know.

Back to Pollen. The anthers have cells (microspore mother cells) that each engage in meiosis to produce 4 other cells (called microspores) that then separate and form a wall. The separate microspores are then called pollen.

So far, except for the formation of the wall, the process is a lot like animal reproduction, where meiosis gives rise to sperm cells. But the plant process is very different. The pollen spore has its own life cycle.

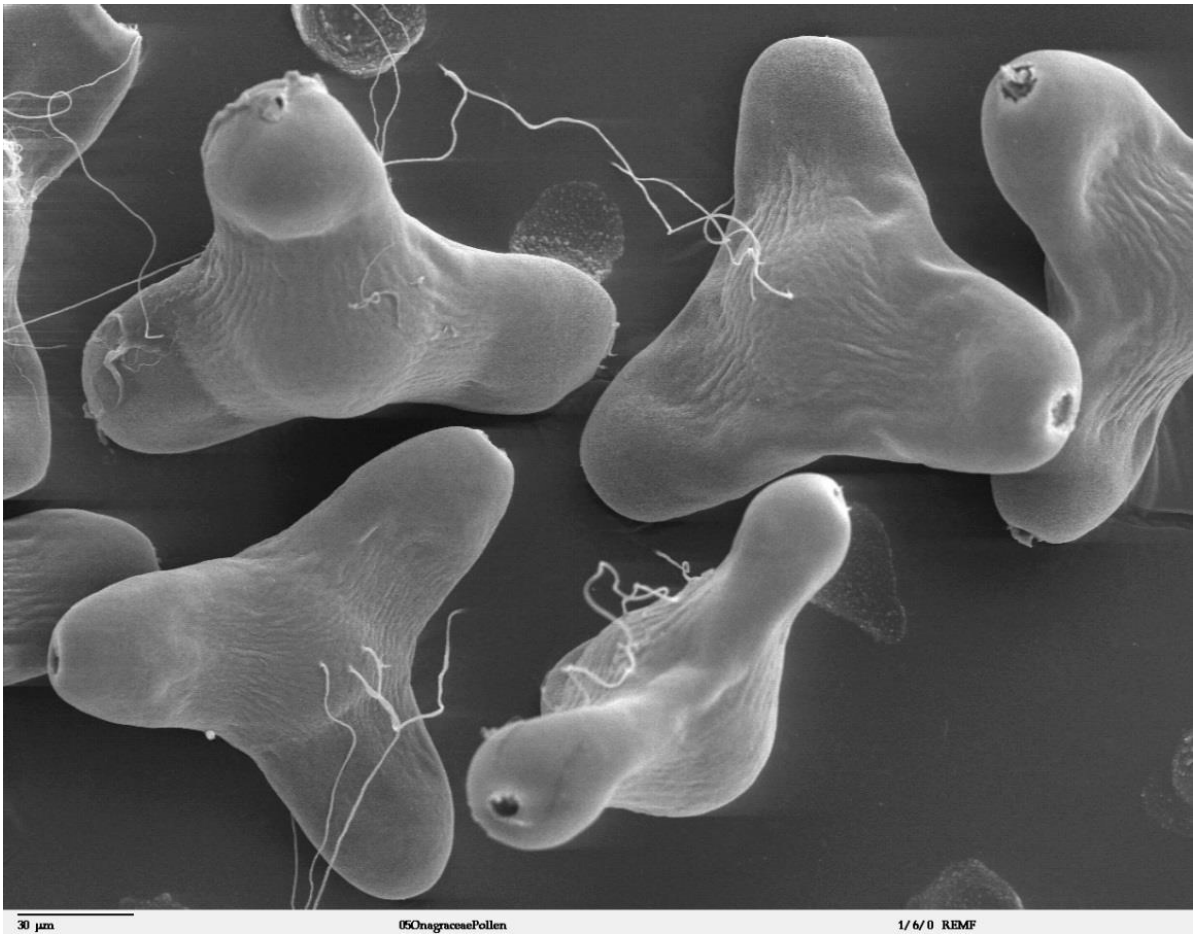
The pollen cell develops into a three celled plant called a microgametophyte. First, the pollen nucleus divides to form two cells, a vegetative or tube cell, and a generative cell. Next the generative cell in the pollen divides to form 2 sperm cells. For about 30% of plants, this second division, occurs while the pollen is still on the anther. For the rest, the generative cell divides only after the pollen has been carried to the stigma. Bromeliads apparently fall in the latter category.

Here is a picture of the interior of a pollen grain.
http://plantphys.info/plant_physiology/plantbasics2.shtml



Pollen has a wall with a tough exterior, called exine, that is very resistant to most chemical processes. The exine of different species can differ enormously, both in size and shape, the number of pores and a variety of other odd features. Because the exine is so tough, many fossils of ancient pollen have been found. The interior of the wall, called intine, is made of cellulose.

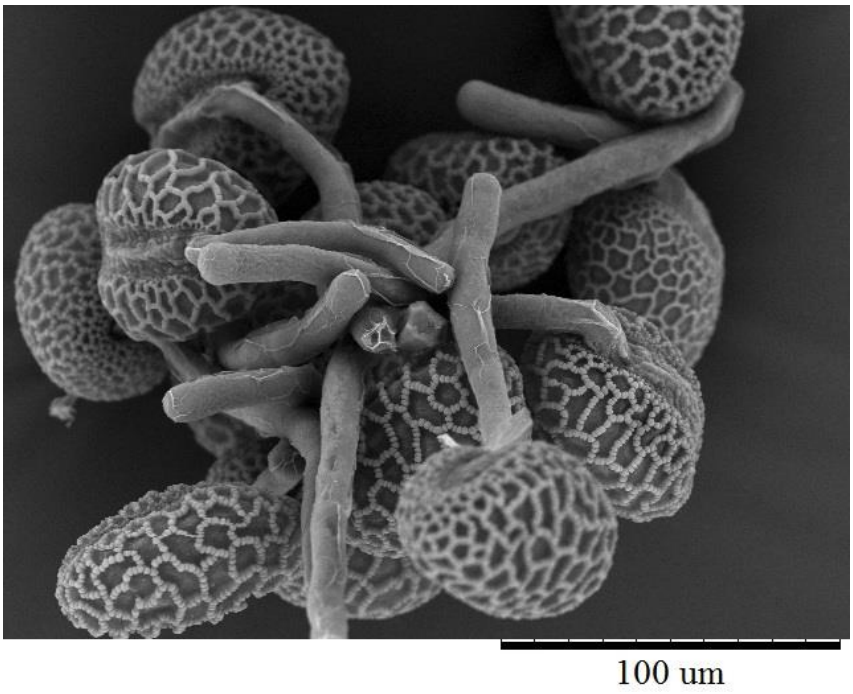
Most bromeliad pollen seems to be generally round. But other plants can have much different looking pollen. This is pollen from *Oenothera fruticosa* (primrose). This work has been released into the public domain by its author, Dartmouth College Electron Microscope Facility,



A very different process occurs inside the ovary. Like pollen, cells in the ovary first produce 4 megaspores. But three of these usually disappear, and the fourth divides to form an 8 celled megagametophyte, one of which is the egg cell.

So what happens next? Wind, insects, birds, bats etc. Depending on the species, each of these can carry the pollen to the stigma of a different plant (or sometimes a stigma of the same plant, or even same flower.), at which time pollination occurs.

But pollination is also pretty complex – I was quite surprised to learn how it happens. I had assumed the pollen just makes its way down the long style of the pistil and then fertilizes the egg. Not right. Instead, recall that the pollen wall has a vegetative cell and sperm cells, as well as a tough exine wall that has pores or other features. When the pollen hits the stigma, the vegetative cell grows through one of these pores and forms a pollen tube, using nutrients from the style to grow down to the ovary. The sperm cells then migrate down the pollen tube until they reach the ovary and the eight celled megagametophyte.



This shows pollen tubes growing from lily pollen. Anja Geitmann, Institut de recherche en biologie végétale, Université de Montréal. https://commons.wikimedia.org/wiki/File:LilySEM.jpg

Then it gets even more surprising. Plants have a double fertilization process. First, like in animals, one sperm cell fertilizes the egg, and forms the plant embryo, which in turn will develop into an adult plant someday. Second, unlike animals, the other sperm cell fertilizes and combines with two of the other cells in the megagametophyte, to form the endosperm of the seed. [2] This is basically a food source for the embryo. Each kernel of corn is mainly the endosperm.

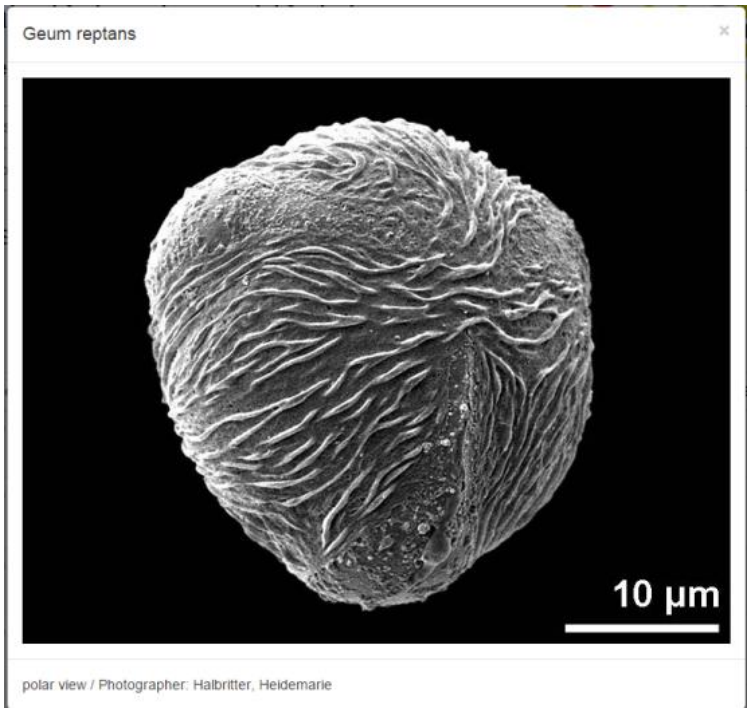
[2] For some if not all cacti, the process is a bit different. The cells in the ovary form perisperm as a food source – the pollen does not contribute anything to the formation of perisperm. One 1986 book says all cacti have perisperm, not endosperm. See The Cactus Primer. Curious if this is still considered true, a couple minutes of looking on the internet revealed completely conflicting information. Some said cacti have perisperm, some said primitive cacti have perisperm and others have endosperm, and some said some cacti have perisperm and others have neither endosperm nor perisperm. The botany book by Prof Mauseth says that in cacti and others in related families, endosperm quickly stops developing and then perisperm develops.

Alternating Life Cycles of Plants. The above process reveals what is called the alternating life cycles of plants. In animals, the adult produces gametes, that is eggs or sperm, that when fertilized result in an embryo. In contrast, in plants, the adult produces spores, which in turn produce gametes.

Everything from the embryo to the adult plant is one cycle called the sporophyte phase or generation. The adult sporophyte produces spores, one of which is pollen.

Pollen is considered a different life cycle. It starts out as a microspore and develops into a microgametophyte that contains the gametes, sperm. Similarly, the ovaries produce a megaspore that develops into a megagametophyte that contains the egg.

Botanists thus say plants have alternating life cycle of sporophytes and gametophytes. Botanists consider the gametophyte to be an entire plant, a different generation than the sporophyte that we normally think of as plants. While the gametophytes of flowering plants are only a few cells, and generally don't last long, in other types of plants the gametophytes live much longer and are more complex. For example, the pine cone is a gametophyte.



As seen earlier, some exine is smooth and others are reticulated. In other cases, the exine has other forms, such as this non-bromeliad with a striate surface, that is, generally parallel grooves.

Next month, Part 2 will address how pollen plays a role in taxonomy.

Billbergia Titan

Above is the inflorescence of *Billbergia* Titan. The pollen is the yellow on the two flowers on either side. I am not sure I have ever seen any pollen that is not yellow or orange- anyone??

Ochogavia littoralis

T. ionantha Sumo

Hechtia rosea