Pritchardia

December 2021 Newsletter *Issue #33*

HAWAII ISLAND PALM SOCIETY
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President's Message

I think the cosmos is telling us that making plans is a worthy exercise, but be ready to toss them out the window and improvise on a moment's notice. Back in November it looked as though we might be able to move ahead with our February rare palm auction with key changes needed to respond to the ongoing pandemic. We arranged for an outdoor (but covered) venue with plenty of breeze to blow those nasty viral particles away. We were counting on the county's outdoor gathering limits to be at least 100. Since we made those plans, Omicron has exploded across the country with 2000 new cases in Hawaii each day as I write, shattering the state's record after nearly two years. Computer models predict caseloads should be peaking in late January or early February. We had hoped to hold the auction on Sunday, February 6. It seems unlikely we will be allowed to gather that day.

Contents:

We will hope for the best, but be ready to reschedule. Our members obviously prefer to get the dates of HIPS events far in advance so they can save the date. The board members certainly prefer more time to plan well in advance. Hosts of garden tours want plenty of lead time to get the gardens in top condition. But as waves of new covid mutants sweep across the world, we must instead try to catch the troughs of low case numbers when large gatherings are allowed. Unfortunately, that results in very short notice of events. Please bear with us.

On that note, I want to thank our recent hosts, David Davenport & Robert Welsch and Bob Carrere & Andy Pesce for being so understanding rescheduling their garden tours to meet the county's gathering restrictions. Both events were fantastic. The sun came out for the Davenport-Welsch tour and the rain miraculously held off for the Carrere-Pesce tour. Both properties were impressive in their own style and nicely illustrated the differing appeal of a relatively young garden and a more mature one. HIPS members are spoiled, but try to remember that no place else in the world can folks enjoy such incredible gardens with an abundance of rare species grown to perfection. We are the envy of the palm enthusiasts around the world.

Rick Kelley

Save The Date: Palm Auction
Sunday, February 6, 2022 (Increasingly Tentative)

The HIPS board has decided to move forward with plans for a February silent and live auction, with significant changes to respond to the pandemic. Hopefully our efforts will be rewarded and the preparations can be useful even if the event has to be rescheduled. This will be a daytime event, outdoors under the covered pavilion at the Leilani Estates Community Center. Please save the date, in case we are still able to hold the event, we will schedule it 1:00pm to 4:30pm. We are considering whether to have some type of boxed lunch rather than a buffet or skipping the meal altogether. A formal invitation will be sent out as plans are finalized.

The only way to pull this event off is to go all in and assume it will happen. We will offer both silent auction (target 80-100 plants) and live auction (target ~20 palms). We are eager to assemble a wide variety of wonderful palm and cycad species to offer our members and guests. If you are interested in donating seeds or seedlings for the silent auction, please contact Rick Kelley at ricklkelley@att.net We will make a go/no go decision by January 25th. Please look around your gardens in late January and early February for any ripe seed you would be willing to share.

Volunteer on the HIPS Board

HIPS is looking for volunteers to fill the open Board Secretary position for 2022. Requirements are to attend quarterly board meetings and record minutes. Volunteering on the HIPS board is a great way to meet people and share your ideas about how to make our society better and keep our members engaged and connected. Please contact Rick Kelley if you are interested in the Board Secretary position or just want to be a board member at large. Ricklkelley@att.net

HIPS Membership Renewal

Many members have received renewal notices and we want to thank those that have already renewed their memberships and hope those that are considering renewal will support us once again. Despite the pandemic shutdown, HIPS has remained in excellent financial health thanks to the success of earlier palm auctions. And of course, these auctions only worked so well because of great support from our commercial nurseries and member growers. Because of our strong financial condition, we were able to suspend HIPS dues for the year of shutdown. We have had socially distanced garden tours at the Kelley (July 2020) Davenport-Welsh (October 2021) and Carrere-Pesce (December 2021) gardens when county gathering limits allowed. We have not been able to bring in outside speaker due to changing travel restrictions, but we hope to invite at least one speaker to coincide with the IPS Biennial tour to Hawaii in October 2022. And we have continued contributing to palm conservation-educational institutions during the pandemic. The board hopes we have earned the trust of our members and expect to fully resume normal activities as quickly as can be done safely.

IPS Hawaii 2022 Biennial

The International Palm Society organizes a week-long tour of palm rich locales every two years. The June 2020 trip to Reunion Island was canceled due to the pandemic. The IPS hopes to bring the Biennial to Oahu and the Big Island, with optional extensions to Maui and Kauai in October 2022. Planning began in February 2021 and a working itinerary has been approved by the IPS board. Understandably, nailing down reservations and pricing for attractions, hotels, ground transportation, and interisland flights has been difficult with so much uncertainty caused by the worsening pandemic. We expect that the IPS will welcome local HIPS members living on the Big Island to the evening lectures and social events for a nominal cost. HIPS members are of course welcome to register for the entire tour at the regular cost including hotel, though more than half the days will be on Hawaii island visiting local gardens that have recently hosted HIPS members. We will notify members when details become final.

Late in the Year Garden Tours – Worth It!

Thanks to our very accommodating garden hosts and clever arranging to meet county gathering restrictions, we were able to squeeze in two garden tours this year.

Saturday, October 30th Kalapana Garden of Robert Welsch and David Davenport

Robert pointing out something fabulous.

David leading the conga line through the garden.

Apologies to those that were not able to attend as we quickly filled up all the spaces and had a few people on the waiting list. Two groups of 25 people were able to enjoy the beautiful weather that snuck in just in time for the tour. We had keiki palms as door prizes and Robert and David were wonderful hosts.

December 4, 2021 Moani-Lundkvist Garden

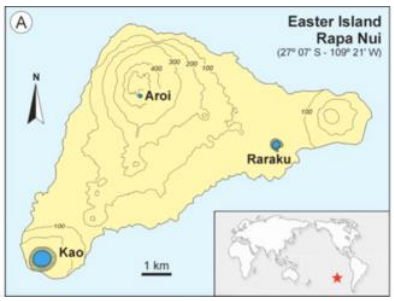
With blizzard conditions on Mauna Kea and a dire weather forecast it was incredible that the weather was perfect for the palm tour. Rick Kelley applied and received a special permit from the Hawaii Civil Defense Agency to have a 100 person gathering. We split the tour into two groups of 50. Although the weather caused a few cancellations we were able to accommodate all members that wanted to see this amazing garden.

Thanks to our hosts Robert and Andy we all learned about the history and future of this legacy garden. Bo Lundkvist was on hand to tell about the early days of the garden.

Upper left: Bob giving an introductory briefing about the vision for the garden in the garden pavilion. Upper Right: Former owner Bo is on hand to answer questions about the palms and garden. Lower Left: The group comes across a large Corypha palm. Lower Right: Bob takes the group through a Keriodoxa under story.

Easter Island Through the Three Eyes of *Paschalococos disperta*

The tiny volcanic island of Rapa Nui or Easter Island, famous for its giant stone statues, is only 63 square miles, less than half the size of Lanai. Rapa Nui is even more remote than the Hawaiian Islands, it is not part of an archipelago but a single tiny island. Although Rapa Nui is the same distance from Chile as Hawaii is from California, the closest inhabited land west of Rapa Nui is 1150 miles away.



Rapa Nui is a subtropical island formed by three volcanos. Raraku with its shallow lake was used as the main quarry for the famous moai statues, Rano Kao holds a continuous fresh water lake, and Aroi crater forms a marsh.

The deserted moai statues looking over dry grass fields are recognizable all over the world, but researchers are still grappling with what really happened to the people who made those statues, and a lot of recent attention is falling on the deforestation of the forest that once covered the island. That forest was dominated by palms.

The importance of being Jubea

No one will be surprised to find our man Dransfield had a hand in identifying the Rapa Nui palm, and he even posted on the IPS Palm Talk forum an explanation for his decision to classify the Rapa Nui palm as an extinct genus giving it the name *Paschalococos disperta* in 1983. From the Palm and Cycad Society of Australia repost in November 2013:

"As I am the guilty party who described the genus *Paschalococos*, I should perhaps write something to clear up misconceptions. The first indication that a palm once grew on Easter Island came from studies of the totally dead pollen preserved in lake sediments on the island. Among the pollen of many different plants were found large quantities of palm pollen and these pollen grains disappear from the record at a time approximately 500 years ago (Based on radio carbon dating). Then dry empty palm nuts were found in a cave, and these nuts look rather like empty *Jubaea* nuts."

Paschalococos disperta endocarps, from the collection of the Muséum de Toulouse

"The extinct palm of Easter Island is represented by "nuts" - hollow endocarps - and casts of root bosses and pollen. There is absolutely no doubt that the palm is a cocoid palm in that it has a hard endocarp and three eyes. The cocoid palms include the Chilean wine palm, *Butia* and the coconut, and many others, all possessing hard nuts with characteristic eyes. The Easter Island endocarps are very similar to those of modern *Jubaea chilensis*, but, nevertheless, subtly different. The differences between the genera in this group of palms are to be found in soft structures such as the endosperm (kernel) and male and female flowers, features that are rarely preserved in the fossil state."

The post reads a bit defensive, and there may have been a couple of reasons. Some may have wanted the palm to be named *Jubea chilensis* to contest recent criticism of the island being considered part of Chile, which is a good question. Chile got possession of the island despite being so far away, having no history of Polynesian culture, and the Dutch and Spanish reaching the island first. Easter Island was annexed in 1888 and formally designated a municipality of Chile in 1966.

The genus *Jubea* was also of interest to forward a particular historical interpretation.

"There seems to be a desire for the palm to be *Jubaea* so that it can feature in theories of how the Easter Island statues were moved about."

Parque Nacional La Campana, Chile. Photo by Dr. Scott Zona.

Jubea chilensis is the closest living palm based on phytolith morphological analysis. Phytoliths are opal like material found in plants, apparently palms produce a lot of this and they are found in ancient sediments. Phytolith comparisons support the classification of Paschalococos as a separate genus.

"Some archaeologists have suggested that the Easter Island palm met its end as islanders cut down the trunks for use as rollers to transport statues. I suggest that a much more likely theory for the extinction of the palm is that the trunks were felled for the edible palm heart - throughout the tropics, palms are felled for this purpose and in some places, such as Madagascar, this represents one of the most severe threats to the survival of many species. An island community in the process of exhausting its resources would have few compunctions about felling trees to eat the hearts."

The theory alluded to above, was part of the popular classic narrative about how the people of Rapa Nui, driven by an obsession for building bigger and bigger moai, exploited and denuded the environment and brought about their own destruction by starvation and war.

They're Just Not That Into You

An alternative theory is that deforestation may not have been so much about exploiting what was there, but with replacing it. When the Polynesians landed on Rapa Nui (likely around 800-1200 AD) they brought with them all they needed to transplant their traditional diet and lifestyle. Saplings from paper mulberry trees used for

clothing, plants including bananas, sweet potato, taro, yams, sugar cane, and ti, and protein in the form of chickens, and rats. The Polynesians cleared land with fire to plant their crops and felled palms to build structures, clearing more forest as the population grew and eventually inhabiting different parts of the island. But before the first crops came in, they ate what they found on the island leading to the extinction of 15 of 25 species of birds, including all land birds that occurred on the island. Palms would have been used in building and thatching. There is little evidence that palm sap, palm heart, or even palm nuts were a major long term dietary component for the Polynesians. For the rat they brought with them, it was a different story. Nearly all endocarps ever found in archeological collections were gnawed on.

It is widely believed that deforestation happened at different times in different locations and at different rates, consistent with an expanding agrarian society. This deforestation is likely to have been hastened by seed predation by rats and two extended periods of drought.

Comparison of % pollen decrease per century in three different sedimentary basins:

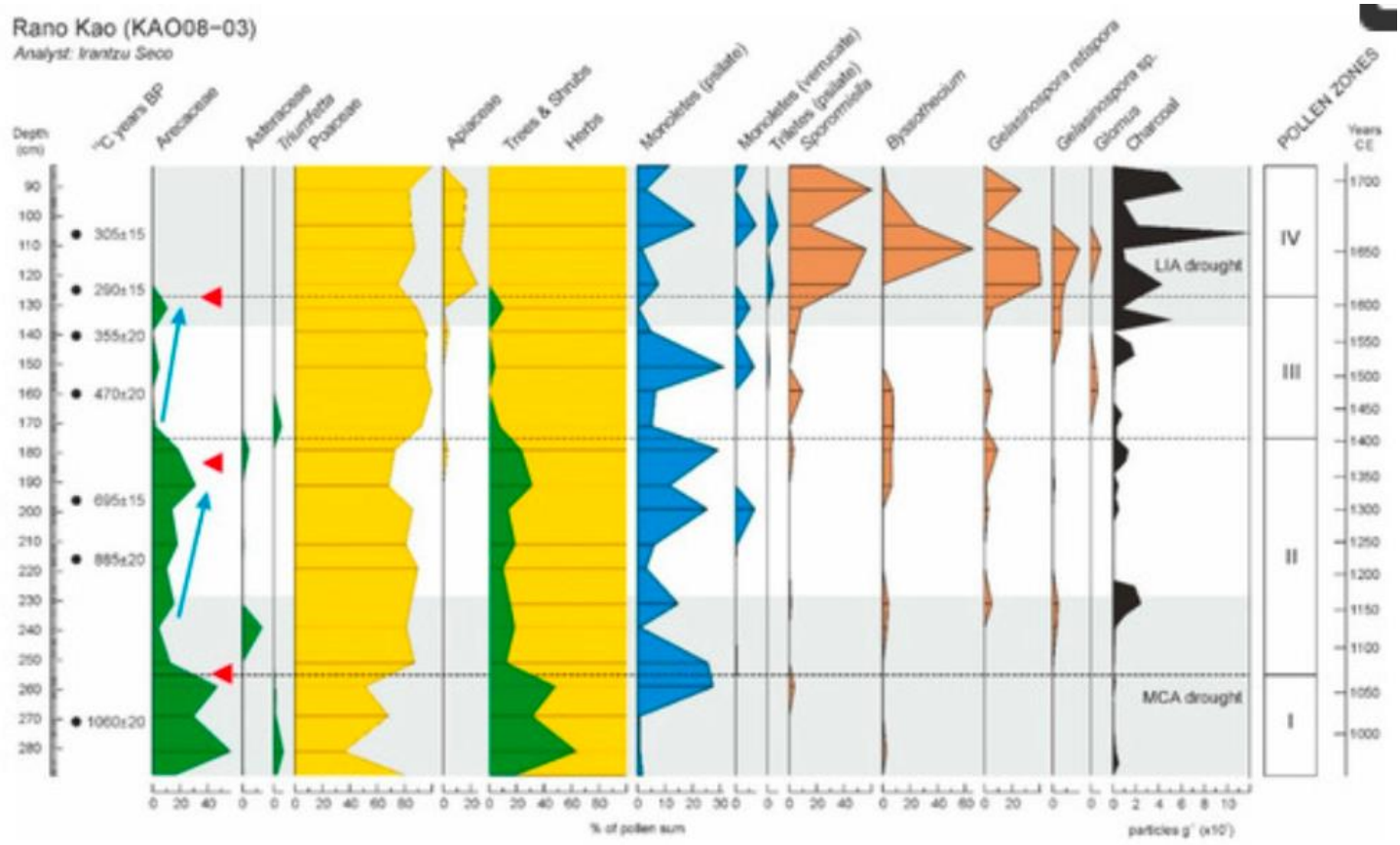
Site	Onset	End	Time (years)	Rates (%)
Aroi	1520 CE	1620 CE	100	−73
Kao	1070 CE	1600 CE	530	−10
Raraku	450 BCE	1530 CE	1980	−7

This table is taken from a preliminary paper in 2019: A Continuous Palynological Record of Forest Clearing at Rano Kao (Easter Island, SE Pacific) During the Last Millennium: Preliminary Report

As we know from living on a young volcanic island, lava rock is porous and water doesn't stay on the surface for very long. On Rapa Nui fresh water was concentrated in two lakes, Rano Raraku (the quarry used for the moai) and Rano Kao (deepest body of water) and a marsh Rano Aroi. *Paschalococos* likely lived in thicker patches on the shore of the lakes and the marsh and in more open forests in drier areas among underbrush and grasses. The island was subjected to fluctuating wet/dry periods caused by El Niño and La Niña weather conditions and periods of extended drought in which lake Rano Raraku completely dried up and only lake Rano Kao provided fresh water. Only recently (2019) have researchers been able to obtain complete core soil samples that span the entire millennium containing the arrival and decline of the Polynesian population. Researchers are just beginning to look at the data and try to make inferences based on problematic proxies (pollen, fungi, and charcoal) for deforestation trends and human activity against a backdrop of climate events. This information is presented in the following graph explaining material collected in the core sample taken from Rano Kao. The graph divides the core sample into four zones, the oldest zone labelled 1 and the youngest labelled 4. The gray shading marks two extended periods of drought. The white shading is a wet period. The first green graph shows palm (Arecacea) pollen in terms of % of total pollen sampled. The yellow graph shows grasses (Poacea), Apiaceae represents bees, The blue graphs are ferns (Monoletes), and the orangish graphs are fungi - Sporormiella found in vertebrate (human and rat) poop, and various fungi that are associated with dead wood. The black graph is charcoal associated with fire. Graphs like this mesmerize me. If Paschalococos is related to Jubea, how much can we guess at its lifespan and flowering habits that would help understand the pollen curves? What was the age distribution in the underlying palm populations over time? Are the small traces of that poop loving fungi a sign that rats made it to Rano Kao before humans settled at its base in 1600? Did humans selectively harvest older palms for building thus taking all the trees capable of flowering?

[A Continuous Palynological Record of Forest Clearing at Rano Kao (Easter Island, SE Pacific) During the Last Millennium: Preliminary Report]

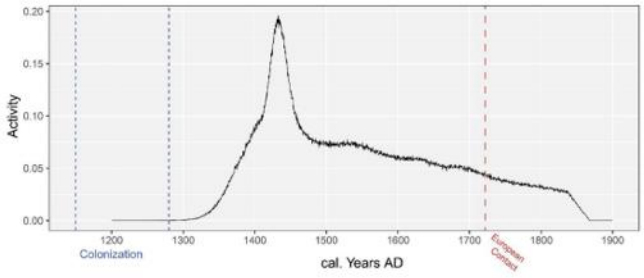
Seco, I.; Rull, V.; Montoya, E.; Cañellas-Boltà, N.; Giralt, S.; Margalef, O.; Pla-Rabes, S.; D'Andrea, W.J.; Bradley, R.S.; Sáez, A. A Continuous Palynological Record of Forest Clearing at Rano Kao (Easter Island, SE Pacific) During the Last Millennium: Preliminary Report. *Quaternary* **2019**, *2*, 22. https://doi.org/10.3390/quat2020022



Polynesians were believed to arrive towards the end of the Medieval Climate Anomaly (MCA) that happened between 500 - 1200 AD. The height of the moai and ahu building and settlement of Rano Raraku coincided with the following wet period. But as the next dry phase set in, a period lasting a century and a half known globally as the Little Ice Age (LIA) between 1570 and 1720 AD, the people started to farm the base of Rano Kao the only permanent source of water around 1550 AD. New rock mulching and rock gardening practices appear in the archeological record. A cultural revolution is thought to have occurred and the political center of Rano Raraku, dry for over a century was practically abandoned. A great intra-island migration saw the permanent settlement of the ceremonial city Orongo at the base Rano Kao around 1600. By then, no palm pollen was present in the sediment samples at Rano Kao. It is thought that complete deforestation of the island occurred around 1650 AD.

The difference between collapse vs societal transition is not clearly defined. The idea that deforestation led to a collapse in the Rapa Nui society, or even that a collapse happened at all is being hotly refuted. While a population decline is widely accepted, its extent and cause is still being debated. A recent manuscript published in 2020 points to chronological evidence that the ahu structures were still being constructed at the time Dutch explorers came to the island in 1722. This is seen as support for societal continuity and against a societal collapse.

Ahu name	Initial platform construction estimate (95.4% HPD)	Years after colonization (95.4% HPD)
Akivi	*1420-1730 cal. AD*	180-515
Ature Huki	*1320-1695 cal. AD*	80-480
Heki'i	*1320-1445 cal. AD*	70-260
Motu Toremo Hiva	*1315-1415 cal. AD*	60-230
Nau Nau	*1410-1450 cal. AD*	145-285
Nau Nau IV	*1435-1655 cal. AD*	180-445
Ra'ai	*1310-1510 cal. AD*	65-310
Rongo 1	*1305-1490 cal. AD*	55-285
Tautira	*1505-1825 cal. AD*	260-610
Te Niu	*1415-1615 cal. AD*	165-405
Vai Teka	*1460-1750 cal. AD*	220-535



Ahu platform construction over time. From *A model-based approach to the tempo of "collapse": the case of Rapa Nui (Easter Island)* Robert J. DiNapoli, Timothy M. Rieth , Carl P. Lipo, Terry L. Hunt 2020

The manuscript draws attention to accounts from the Dutch and later Spanish explorers in 1770 mention seeing ceremonial activity at ahu. And maybe a few palms still survived based on Dutch memoirs recalling the houses they saw were thatched with palm leaves and that they were presented a palm leaf as a sign of peace by the natives. The Dutch estimated the island population between 1000-3000 individuals, though they had very limited exposure to the full population. (Estimates of the population of the island at its height vary, but most put it at around 15,000 individuals.) The Dutch logs also mention the islanders trading 60 chickens, bananas and other foods with them and describe much of the land under cultivation. The palm forests that once covered the island likely replaced by grassland and gardens. What palms might have been remaining would not have survived past the 1900s.

If you are interested in what may have happened to the people of Rapa Nui, I highly recommend this The Fall of Civilizations podcast episode.

Note from the editor:

This newsletter goes out quarterly (more or less), the next newsletter will go out March 31st. If you have any questions, comments, or would like to contribute to the production of the newsletter, contact Mary Lock at marylock@sbcglobal.net.