PLATYCERIUM

HOBBYIST'S HANDBOOK

BY ROY VAIL

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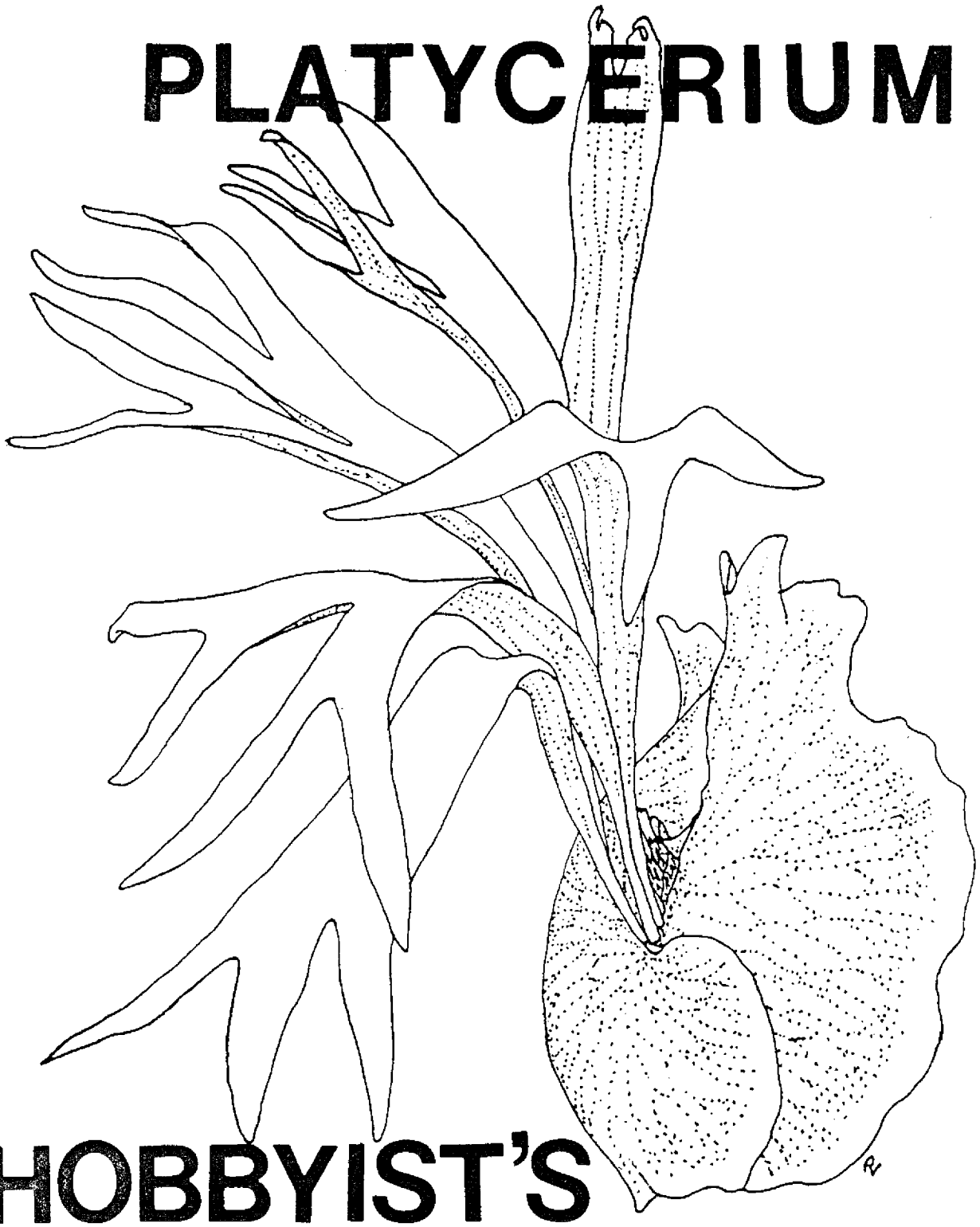

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Library of Congress Cataloging in Publication Data

Vail, Roy (1937 -)
Platycerium Hobbyist's Handbook

1, Ferns I. Title

SB 429.V35 1984 635.9'37'31 84-7202 0

ISBN: 0-9614003-0-7

~DBP~

Desert Biological Publications
Box 722
Mena, Arkansas, 71953

First edition:

First Printing	October 1984
Second Printing	February 1985
Third Printing	May 1985
Forth Printing	November 1989
Fifth Printing	September 1990
Sixth Printing	July 1992
Seventh Printing	May 1993
Eighth Printing	June 1995
Ninth Printing	February 1997
Tenth Printing	September 1997
Eleventh Printing	March 1998
Twelfth Printing	October 1999
Thirteenth Printing	February 2000

This photo of a giant *P. wandae* is also Fig. 9. The color print reveals a light dust of brown spores on the upper surface of the fertile fronds.

Table of Contents

ACKNOWLEDGMENTS

I wish to thank the many people who allowed me to visit their collections, ask questions, and take photographs. These include: Dr. Frank Schlicht, Virginia Ault, John Bender, Elaine Spear, Rick Neidhart, Robert Oman, Mickey Carmichael, Fantastic Gardens, Mildred Murray, John Wills, Don Callard, Ray Sodomka, Boyd Harrin, Marvin Haworth, Carolyn Rodefer, Frank Stewart, Ed Moore, John Roach, Kartuz Greenhouse, Rudolf Ziesenhenne, Dorothy Estabrook, Bill and Helen Shortt, Bill Cook, Porter's Tropicals, Dr. Mardy Darian, Susann Harper, Susan Eatherton, Dr. Hank B. Weyland, and Jule Pauliny.

Many have helped in special ways: Tom Henrichs and his family put up with me for days, and Tom and I traveled together in Florida, Ralph and Elizabeth Hughes have given many hours of help, many *Platycerium*, and allowed me days in their extensive *Platycerium* experimental collection, Jerry Horne gave much horticultural advice and his family welcomed me during visits three summers, Phyllis and Ed Bates spent days making contacts for me and we visited collections together in southern California, Ernie Sanchez spent nearly a day answering questions and carrying plants around in his nursery for me to photograph, David Miller photographed plants in his nursery since my visit there was at an inopportune time, Dorothy Behrends talked with me about the Cass cultivars on the morning of her 76th birthday, Milton Piedra was an exquisite host in Miami, Barbara Joe Hoshizaki commented on my questions, Eugenio Pingatore of Argentina made the fine drawing on page 43, Eth Williams related her experiences with *P. madagascariense*, and the San Diego Fern Society sponsored the printing of the covers. If I have forgotten anyone, I can only say I am sorry, it was not intentional. The *Platycerium* hobby is full of nice and interesting people.

Phyllis Bates, and my mother, Mariann Vail, read early forms of the text and offered extremely valuable suggestions and needed encouragement. Ralph Hughes, Tom Henrichs and Susan Eatherton reviewed later versions and each contributed significantly to improving the book. However, not all these people agree with everything I have written. Any mistakes, misconceptions, or opinions are entirely my own.

Common names are from Ralph H. Hughes, 1981, Common Names of Staghorn Ferns, Fiddlehead Forum, Vol. 8(3):21, May-June. The information for distribution maps is mainly from Hennipman, E. and Roos, M. C. 1982, A Monograph of the Fern Genus *Platycerium*. All maps, drawings and photos are by the author unless otherwise indicated.

FOREWARD

I have known Roy Vail for several years and have watched this book progress from just an idea to reality. Roy and I share two things: a fascination with the genus *Platycerium* that, at times, borders on an obsession, and relative isolation from the rest of the staghorn world. Hence, I can feel a special empathy for the problems envolved in this project. Roy traveled nearly 12,000 miles in the last 3 years, most of it on busses. He has visited nearly every commercial dealer and major private collector of *Platycerium* in the U.S. I accompanied him on one trip to Florida and observed first hand the countless rolls of film taken and the numerous questions he asked of various collectors. I particularly remember one sultry evening sitting together on Milton Piedra's front porch about 10 PM. We had spent all day visiting nurseries in Miami and were waiting for Milton to arrive, as he had agreed to "put us up" for the night. I thought to myself, "I don't know how I made it through today!" Then I thought about Roy doing it day after day, many times after sleeping in his seat on the bus at night. It has to take a special dedication to devote the amount of time and money that Roy has, to a project that holds no guarantee of success. I don't know how much time Roy has devoted to correspondence with other collectors, but if the dozens of letters in my file are any indication, he has been busy night and day.

Roy Vail is a high school biology teacher, who has been photographing plants as a hobby for 30 years. He lives on the desert, about 5 miles north of Las Cruces, New Mexico. At 4,000 feet elevation, Roy has the dual problems of very low humidity and large temperature differentials. He has overcome these problems by designing and constructing his own greenhouse. It is sunk 4 feet in the ground with earth bermed up almost 9 feet against the north wall. He uses the earth to moderate temperature and uses evaporative cooling aspen pads and fans to maintain sufficient humidity and limit high temperatures. With the relative lack of insect pests that bother *Platycerium* in his location, he has been able to provide growing conditions that often surpass those of areas normally considered conducive to good staghorn culture, i. e. south Florida and coastal southern California. Additionally, Roy has provided micro-climates within his greenhouse by the use of alternating translucent fiberglass and opaque panels.

This book is unique in that no one previously has attempted to photographically document all the cultivars. It also fills the void in current information readily understandable by the amateur hobbyist. It is the first individual undertaking, not related to a research paper or scientific publication since Wendy Franks' book in 1975. Both the beginner and the expert will find useful information included.

Roy and I share one other thing: the sincere hope that others discover the rewarding hobby of growing staghorn ferns. I believe that with this book, Roy has made a major contribution toward stimulating interest in the genus *Platycerium*.

Tom Henrichs Foley, Alabama

INTRODUCTION

My hope is this book will be a service to the *Platycerium* hobbyist who is just starting as well as the one who has grown these ferns for years. The beginner will find a wealth of information based on the experiences of others and numerous example species, cultivars and methods which can open new views and interests in this hobby. The experienced hobbyist will find a level of treatment never before given the genus *Platycerium*.

But no one who writes a book on a group of plants knows all there is to know about that group of plants. The total expert just isn't alive. Rudy Ziesenhenne told me, "To know these plants you have to GROW them. People who write books from other books aren't doing anybody any good." Realizing this, I have relied as little as possible on the writings of other people, and as much as possible on my own experiences and those of nearly everyone I could find, visit or write, who knew, grew, imported, collected, or photographed *Platycerium*.

During such an extensive information gathering project, a variety of ideas developed. Below is an assortment of them, some are advice.

1. Different people who grow the same species well may use different growing methods.

   To me this means the plants themselves are adaptable and can be grown under different conditions. But this also means methods that work in one location may not work in another. Each of us needs to experiment with different growing methods. There may not be a best way of growing some *Platycerium* species.

   But, most importantly, it means if you are already successfully growing a *Platycerium* species, do not change your method simply because it does not match what is described on one of these pages. Keep doing what you are doing, and tell ME about it, so later editions of this book can be better than this one. Look upon what is here only as a collection of clues, based on people's experiences, for you to consider only if your current growing methods might benefit.

II. There could be other books written about *Platycerium*.

My visiting also forced me to decide early what type of material would be in this book. The title "Platycerium Hobbyist's Handbook" guided me to include what could be useful or interesting to anyone who has some *Platycerium* and wants to pick up a book that tells what they are and how to grow them.

There is also a very different type of information. Largely in the memories of people now in their 70s and 80s are accounts of the early days of collecting, importing, and growing *Platycerium*. They are stories of competition, feuds, personalities, explorations, and human events, which all will slowly be lost as these people pass on. It would take long recorded discussions with many people to even begin to put these stories together in a meaningful way, far beyond the scope of this book. The resulting book would not tell the reader a thing about how to grow or identify *Platycerium*, however it would be fascinating reading.

III. The difficult species are difficult for everyone.

Fewer than five people known to me keep *P. madagascariense* or *P. quadridichotomum* with any success. This does not mean keeping them is impossible. It may mean they require special care, and special environmental conditions, which few people are willing to provide year after year.

IV. Please keep those labels.

There are many large and beautiful *Platycerium* whose labels have been lost. To the beginning hobbyist it seems plants take forever to become large or pup, but in a few years some are giants and others have pups galore. But where are the labels? Too often the *Platycerium* have overgrown them, or the pen faded, or the plastic label cracked and part of it fell off. The name is gone.

The solution is prevention. Use metal labels, non-fading nursery pens, nail labels to the front AND back of boards, or paint them, engrave them, woodburn them, do anything to make the label permanent. No one can remember the names of an entire collection. Please keep those labels.

V. Insist on correct labels and information.

It makes a collection of *Platycerium* more interesting if it has as much history as possible on each plant. In my collection one has a label that goes back through three people, the last on the list collected it in Madagascar.

But, if you buy a plant from a dealer with what you feel is incorrect information, take the dealer to task. One hobbyist had on the same wall three very different plants, all bought from the same dealer, all sold as *P. bifurcatum* cv. Majus. She thinks the dealer just labels plants with the name the customer is requesting. In my opinion the dealer doesn't deserve to be in business. Incorrect information is worse than none at all.

VI. There is great concern about the destruction of tropical forests by man.

My starting attitude toward collecting in the wild and importing was: *Platycerium* should ideally be propagated from pups and spores so those in nature could be left there. But many collectors and importers feel the tropical forests are being destroyed so rapidly by oil companies, lumber companies, or for crops and cities, that the very best chance the *Platycerium* have is to get them from the wild and into cultivation. It is not clear to me which view is the more realistic, but concern about destruction of tropical rain forests is very real.

Very debatable situations have developed over the ethics of collecting. One collector wanted the *Platycerium* in the upper branches of a tree, but would have to cut the tree down. The collecting permit forbid that. Returning a year later, the collector found that very tree had been cut down to clear the land, and the *Platycerium* no doubt had died. The collector then illegally cut down a nearby tree and got the *Platycerium* in it. Should the second tree have been left for probably the same fate as the first?

In another case, an article was being written. It described the environmental conditions on an island where *Platycerium* were collected and exported. Then it described how they adapted to the different environmental conditions in another part of the world. Before publishing the article, its author discovered that the plants were

collected and exported clandestinely. Should the article be published, showing that the author purchased illegally collected plants, or withheld, even though that means the results of the study will be lost?

VII. The naming of cultivars is completely out of control.

You could name any *Platycerium* after any person, place, or thing not already used as a name, and that name could get into the trade. Unlike orchids and begonias, there is no organization which outlines the rules for giving names and then registers the names.

The cultivar section in this book is the most complete ever published, with a photo of nearly every one, but the photos also show that few of the cultivars are distinct. Often the differences between cultivars were originally caused by growing the plants in unusual environments. When they are grown in the same environment side by side, the differences disappear. Very often the differences between the fronds formed by one plant may be greater than the differences between cultivars.

VIII. The current cultivars have been formed mainly by chance.

The reason so many of the cultivars look alike after being grown in the same conditions is their formation has been largely by chance. The days when a truly unique cultivar can be found as a volunteer sporeling, or as a slightly different plant among many sporelings, are about over. Now is the time to begin systematically developing new cultivars by selecting specific traits among sporelings over several generations.

For example, if the goal of a breeding program is for very wide but undivided fertile fronds, locate two cultivars now available that show wide fertile fronds, carefully cross them, select among their offspring for the very widest that are undivided, cross them, select again and keep selecting for an extremely wide cultivar. The same can be done for high number of pointed tips, for tips that curve to the side, for long narrow fronds, or any other trait.

There are no known variegated *Platycerium* cultivars. Some experiments with irradiated spore, even using ultra violet light, might produce some.

What has been lacking is systematic effort to develop *Platycerium* cultivars that show specific forms.

IX. Truly observe these interesting plants.

Taking notes on what your *Platycerium* are doing during the year adds dimensions to your hobby. What time of the year do different species form shield fronds? When are they growing fertile fronds? When are the shield fronds all dead? When are the shield fronds all green? When are the plants dormant? What species go dormant? How long do the fertile fronds live? How early can you tell where the spore patch will be? Share this information so it can become known if the answers to these questions are different in different localities.

Fig. 1 A variegated, green and yellow, *Platycerium* in the nursery of Jerry Horne, in Miami, in 1980. Later the plant turned all yellow and died. None of the pups were variegated.

X. Support responsible small nurseries.

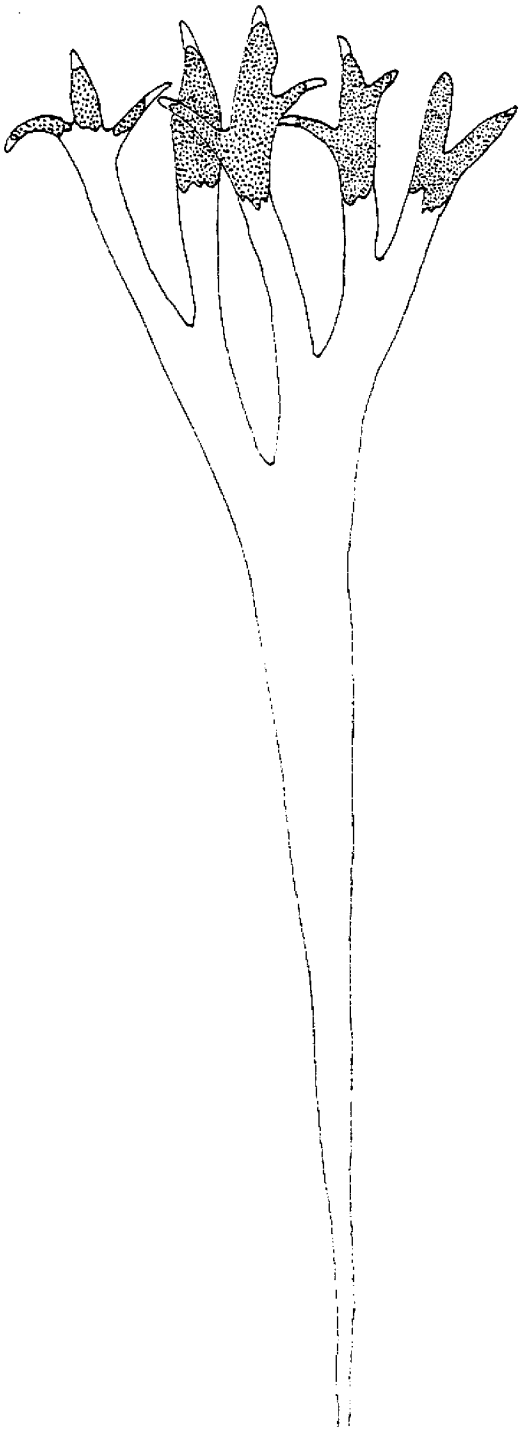
Most of the *Platycerium* of interest to the serious hobbyist are grown, developed, or imported by a very few small nurseries. In these days of big business, it is difficult for these little nurseries to keep going. Find the truly reliable ones and support them. Support can come in many forms. Send them pups they can sell, send them starts of cultivars that are truly different, ask them for spore and give them some of the sporelings in trade. Support also means buying from them. They live on money like the rest of us. The *Platycerium* hobby has been improved greatly by the small nurseries.

XI. If you travel, take notes, take pictures, and write.

Those who are fortunate enough to travel to the places *Platycerium* are native can help the rest of us greatly. Take notes on where the *Platycerium* grow, photograph them, and when you return, write an article for a hobbyist publication. But, remember your readers. Even though your most vivid experiences may be in the traveling, the hobbyist reading your article is looking for information that will aid in understanding and growing *Platycerium*. Write what is accurate and practical for the reader.

A *Platycerium* picture is truly worth a thousand words, so there are no long technical descriptions of species or cultivars in this book. Descriptions are hardly possible with the cultivars, and are readily available elsewhere for the species.

Finally, the best reason to keep any *Platycerium* is because you like it. Keeping correct labels and names is extremely important, but even in my collection there are a few with no names, there just because I LIKE them.



P. bifurcatum cv. Majus

CHAPTER ONE: General Information

I. Names:

Scientific names are part of a classification system made with the goal of showing natural relationships. All plants and animals are given two word scientific names. The first word is the genus name, the second the species name. Staghorn ferns all have the genus name *Platycerium*. Closely related genera (genera is the plural for genus) are grouped into Families. *Platycerium* is in the family Polypodiaceae which also contains *Pyrrosia*, their closest relatives.

Currently 18 species of *Platycerium* are recognized.* Three natural groups of *Platycerium*, each from a different region, seem evident:

Java-Australian	Malayan-Asiatic	Afro-American
willinckii	*superbum*	*alcicorne*
	holttumii	*ellisii*
veitchii	*grande*	
	wandae	*stemaria*
bifurcatum	*wallichii*	*elephantotis*
hillii		
	coronarium	*andinum*
	ridleyi	
		quadridichotomum
		madagascariense

The order and grouping under each location is to show relationships. Later, where the species are discussed individually, they are arranged alphabetically for ease.

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* Variety name (var.), subspecies names (ssp), and cultivar names (cv.) may be after the species name. Hennipman and Roos, in the book, "A Monograph of the Fern Genus *Platycerium*," 1982, consider the number of species to be 15. They combine *P. veitchii*, *P. hillii*, *P. bifurcatum*, and *P. willinckii*, making one species of the four.

II. Parts of a staghorn fern:

A. Bud-

All new growth starts in the bud. It may be covered with thin scales. The shape, thickness and color of the scales are sometimes used to identify species. If the bud of your plant is dead, for all practical purposes, your plant is dead also, though it may take several weeks for all the other parts to turn brown and fall off.

B. Rhizome-

As the bud makes new growth, it moves forward and upward, forming behind it a type of stem called a rhizome. The rhizome is hidden among the shield fronds and does not show unless they are cut.

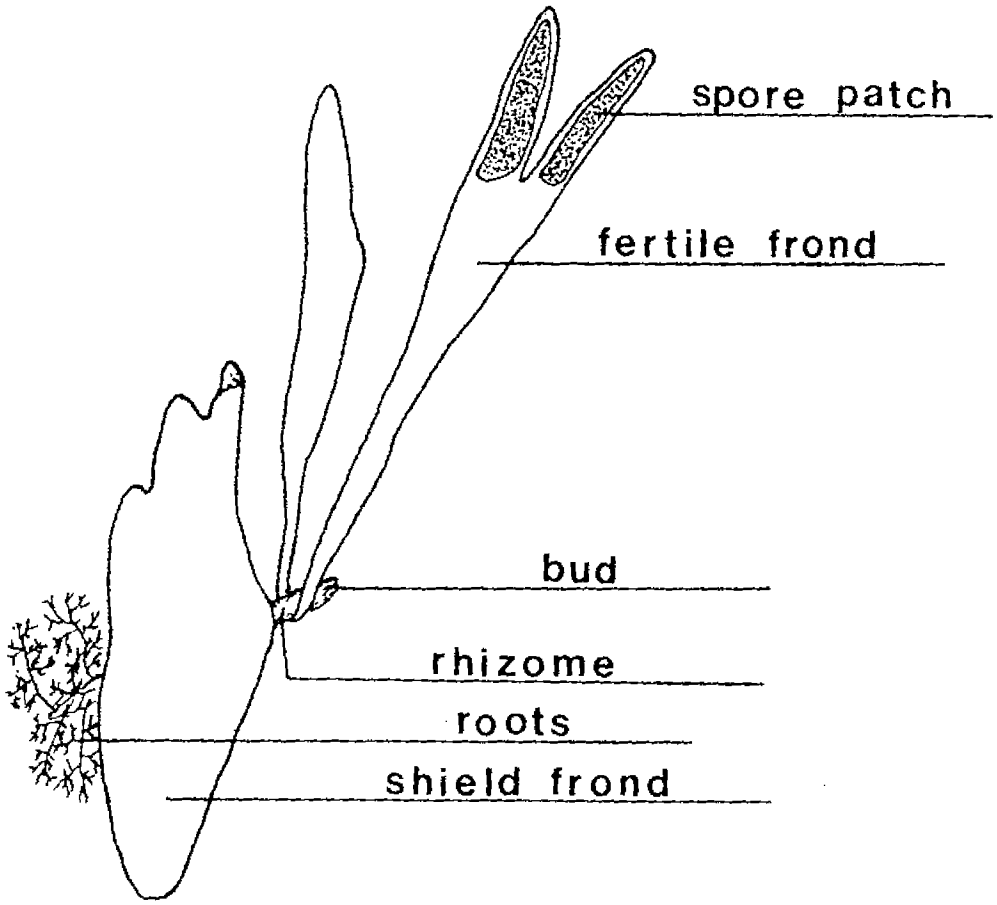
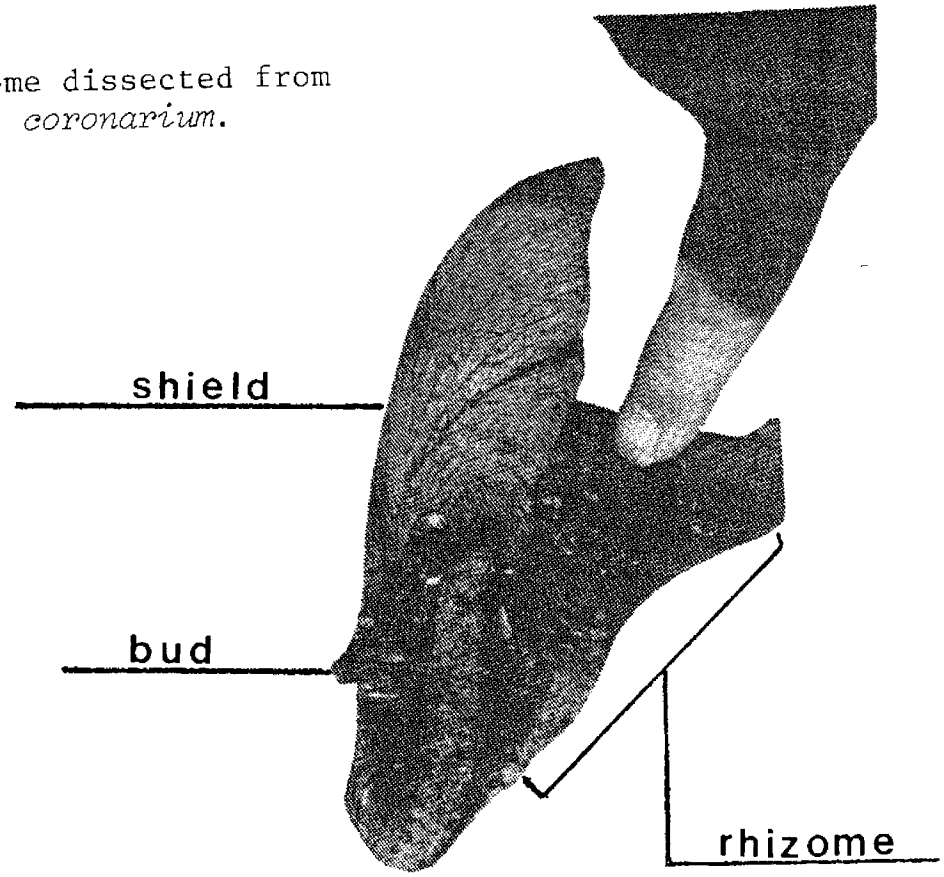


Fig 2 Parts of the staghorn fern. The rhizome has been drawn longer than it is.

Fig. 3 The rhizome dissected from a dead *P. coronarium*.



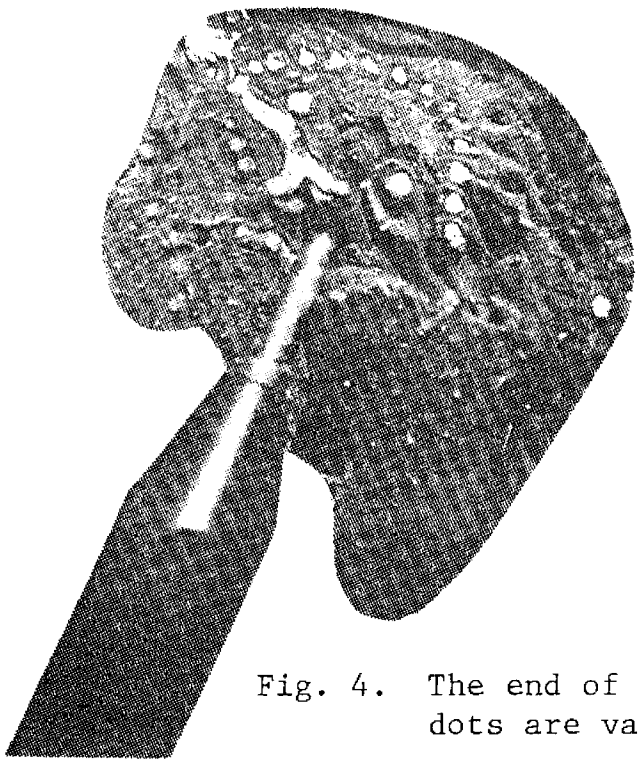


Fig. 4. The end of the rhizome in Fig. 3, the white dots are vascular bundles.

C. Fronds-

The leaves of ferns (and palms) are called fronds. Staghorns form two types of fronds.

1. Fertile fronds-

These grow down or outward from the bud, and produce spore patches. Not all fertile fronds on young plants form spore patches, but those on mature plants with adequate light should.

2. Shield fronds-

These grow back from the bud, and cover the roots. In most species they turn brown quickly, becoming a thick mass of water and food storage cork, with roots between the layers.

D. Roots-

Branching off the rhizome, they grow between the old shield fronds, and in the material that naturally collects behind the shield fronds.

Fig. 5

Newly imported *P. coronarium*, with shields and bud. Shields are cut back to decrease shipping weight. The plant soon recovers.

III. Growth patterns-

In nature *Platycerium* live as epiphytes, plants that grow upon other plants, but make their own food. Most bromeliads and orchids are also epiphytes. Often living high in the branches of trees, epiphytes must somehow solve three main problems:

A. Attaching themselves firmly
B. Collecting nutrients
C. Collecting and storing water

These problems are solved somewhat differently by the solitary species than they are by the species that form pups.

Solitary species:

These species reproduce only by spores and grow into single gigantic specimens with only one bud. They solve the three problems of epiphytes by:

A. Attachment:
Their attachment problem is solved by the large shield fronds wrapping around the tree trunk, and to a lesser extent, the roots growing into the outer, non-living layers of the tree.

B. Nutrients:
Nutrients and organic matter build up in great amounts behind their shield fronds. Older shield fronds die and roll back, while other natural material collects.

C. Water:
Their water problems are solved by the spreading tops of the shield fronds collecting rainwater which runs down into the shield frond mass behind the plant and is stored.

The solitary species are:

P. grande	*P. ridleyi**	*P. wallichii*
P. holttumii	*P. superbum*	*P. wandae*

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**P. ridleyi* is an exception to these. It stays smaller and does not collect nutrients or water as described.

Pup-forming species:

The size of the clusters these species form is massive. A friend of mine saw a cluster of *P. bifurcatum* that grew so heavy it pulled the bark off the tree and a cluster the size of a small car fell to the ground. As another example, *P. alcicorne* is reported to entirely cover the trunks of palm trees, from near the ground up to where the palm fronds form shade.

A. Attachment:
They solve the problem of attachment by making a mass which completely surrounds the stem of the support plant.

B. Nutrients:
The different species vary in how much nutrient matter they build up behind their shield fronds from what falls there. Those with shield fronds whose top edge extends forward, away from the tree, build up decaying material in back. Those whose shield frond top grows against the tree must get their nutrients from their own old shield fronds as they die.

Fig. 6

A tiny bud on the surface of the shield frond of the pup-forming cultivar, *P. bifurcatum* cv. Santa Barbara.

C. Water:

Water in great amounts can be stored in the cork tissue of old shield fronds. One species is from an area that can go without rain for three months.

The pup-forming species are:

P. alcicorne	*P. elephantotis*	*P. quadridichotomum*
P. andinum	*P. ellisii*	*P. stemaria*
P. bifurcatum	*P. hillii*	*P. veitchii*
P. coronarium	*P. madagascariense*	*P. willinckii*

The method of surviving in nature of the pup-forming species and solitary species is very different. In solitary species, the individual being able to live for a long time is the basis of survival. In pup-forming species, the cluster or group is the basis of survival. An individual of the pup-forming species may die, or be lost, as long as the group survives. So, in nature, collecting plants from a cluster of a pup-forming staghorn is not nearly the threat to survival of its species as collecting plants of a solitary staghorn is to its species. The pup-forming one can replace the plants lost with pups from those that remain, but the solitary one can replace those lost only if there are successful spores that come in from other locations.

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For additional reading-

Hoshizaki, Barbara Joe, Morophology and Phylogeny of *Platycerium*. Biotropica, 1972, 4(2) 93-117 A study of cells and tissue structure. Contains a key to species, and a diagram of the relationship of the species.

Hoshizaki, Barbara Joe, The Rhizome Scales of *Platycerium*. Amer. Fern J., 1970, 60:144-160

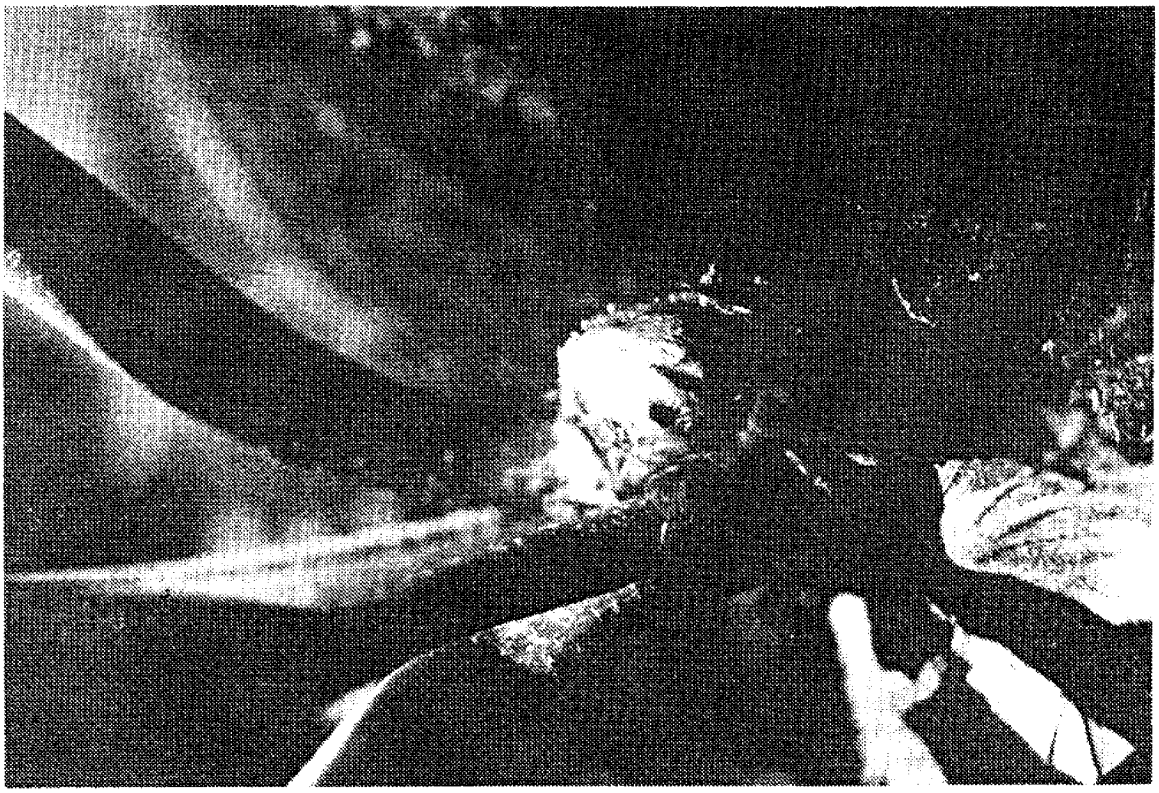

Fig. 7 Healthy bud of *P. coronarium*, with rhizome scales.

CHAPTER TWO: Cultivation

There are almost as many ways of cultivating staghorns as there are people who do it. The general ideas are:

I. The staghorn needs material where roots can grow.

Currently most hobbyists and nurseries use sphagnum alone, regular or green. Mosses from Wisconsin, Washington, Florida, Oregon, Michigan and Germany are commercially available. Mail-order suppliers sell moss by the bale. Since osmunda fiber lasts longer and drains faster, growers where excessive rainfall is a problem mix it with sphagnum moss. Sphagnum peat is rarely used since it holds much moisture and gives off a material that stains the shield fronds. The product called orchid bark is reported to cause many root problems.

II. The staghorn must be attached or mounted.

A. General considerations-

The type of mounting used for a *Platycerium* depends on how the owner wants it to develop. The plants are adaptable. Redwood or cypress boards*, driftwood, cork plaques, chickenwire baskets, weldwire baskets, redwood boxes, redwood flats with chickenwire over the front, flower pots, treefern pots, trees, big balls of moss on chains, poles with creosote running out, are all used somewhere by someone. In nature *Platycerium* even grow on rocks.

When newly received a staghorn may be in a flower pot. Usually such plants are large enough to be transferred to a moss mounting. Such plants are only juveniles, so try to learn what size they can become and plan accordingly.

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* Both redwood and cypress are essentially non-renewable resources. It is not practical to grow them on plantations so those that are cut are rarely replaced. Rather than contribute to the removal of these historic trees, it seems better to use pine, and coat it to prevent its rotting.

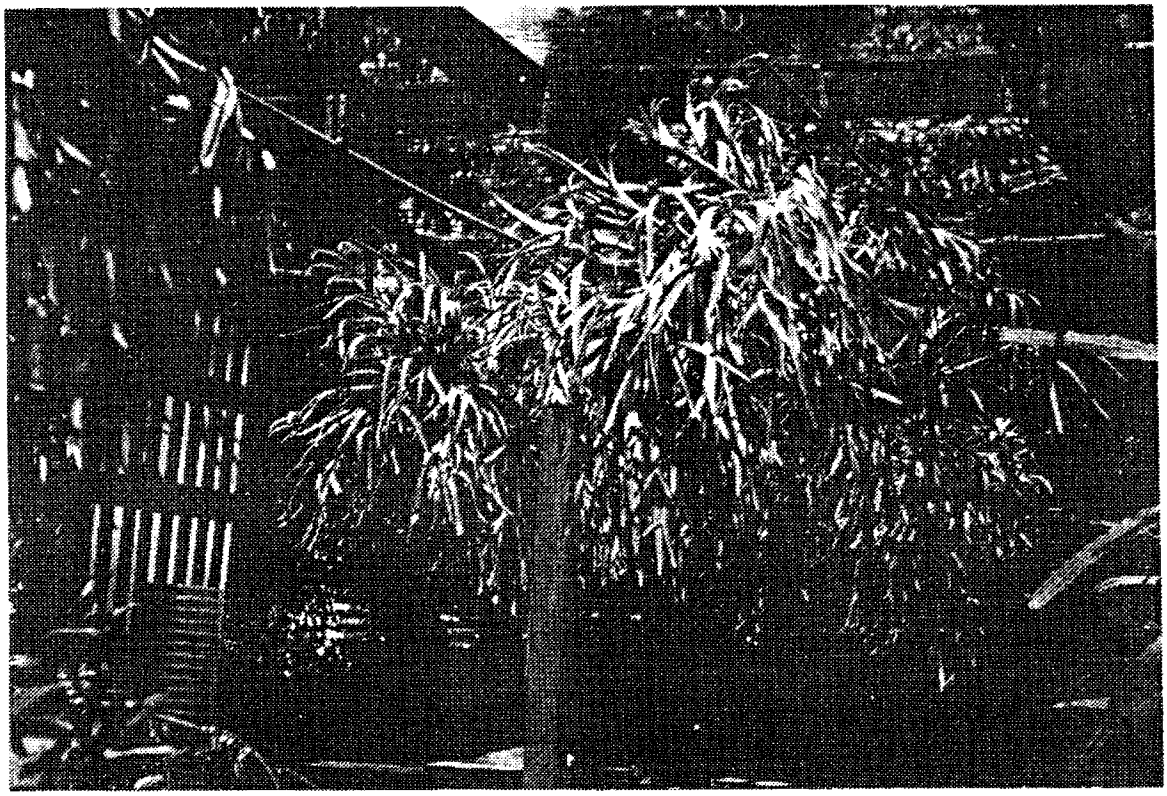


Fig. 7 Two large balls of *P. veitchii* cv. Lemoinei.

Fig. 9

One of the largest specimei
of solitary staghorns
this country is this gia
P. wandae in a tree of
collector in Miami.

When mounting, consider the differences between the species that stay solitary and those which form pups. Special requirements for particular species are in Chapter 4.

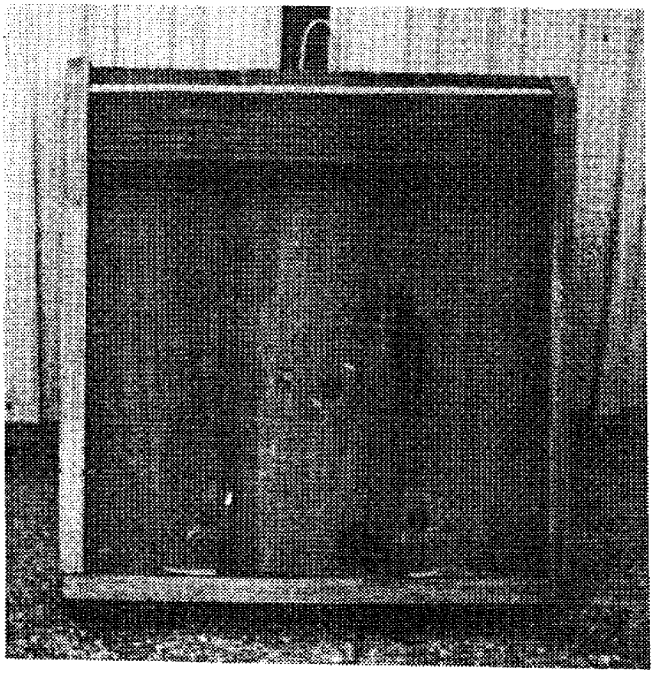
B. Solitary species-

These are mounted on boards, on trees, or on redwood boxes. A common way is to put roofing nails around the edge of a board, or on the tree. Small plastic coated wire is wrapped around the nails and then across the shields. The large heads of roofing nails keep the wire from coming off. New shield fronds will grow over the wires and nails. More wire is added as the plant gets larger. Some people drill holes in the boards, then run nylon line through them, or put nylon netting over the moss and staple the netting to the board.

If the plant gets too large for the first board, it may be best to fasten the first board onto the next larger board. In any case, do not damage the bud, or cover it.

Fig. 10

A "Bill Shortt Box." It is packed with moss and chickenwire is put on the front. The shape of the water trough in the top assures water gets to the roots.



C. Pup-forming species-

As time goes by, these will form pups and clusters in nearly every case. If the pups are to remain, plan where they can be. On a board, the parent plant can be put on an extra large pad of moss, and plan for the pups to form around the edge. On driftwood, moss can be packed in places where the roots should grow and become the buds of pups.

In round baskets, the parent plant is often put in the open top so the pups can form on the sides. Rectangular wire baskets are often made only eight or ten cm (two or three inches) thick, so the roots soon reach the back where they form pups.

However, pups will not form where planned unless the spot is kept moist. The most common mistake in making a basket is to pack the moss too loosely for it to stay moist, so the expected pups never form. On a board, if the moss on each side is not kept moist, the pups come out the top and the bottom, where the moisture tends to be.

There can not be a single best way to mount *Platycerium*. Keep in mind the requirements of the species, and plan ahead for the appearance you desire.

III. The staghorn must live relatively free of pests.

A. Insects:

1. Control Program-

Part of the reason some growers "have luck" with the difficult *Platycerium* species is they control insects. Control means preventing insects from getting started, rather than waiting to battle outbreaks. One sowbug can make a mess out of fronds that took a year to grow. Waiting for this to happen doesn't make sense. There is a saying, "A cockroach would walk a mile just to eat a *Platycerium ridleyi*." Don't wait for him to get there, stop him in his tracks.

Spray the plants completely. Sometimes the tips of fronds can burn because the spray runs down to them, and as the water evaporates, the spray is concentrated

there. Normally spraying should be done after watering to avoid allowing the spray to soak to the roots. However, if an insect keeps reappearing, it could be coming out of the moss, and a thorough drenching of the moss and roots may be the only cure.

With a program for prevention, it is important not to rely on just one spray as insects may develop resistance. Pick about three and rotate their use.

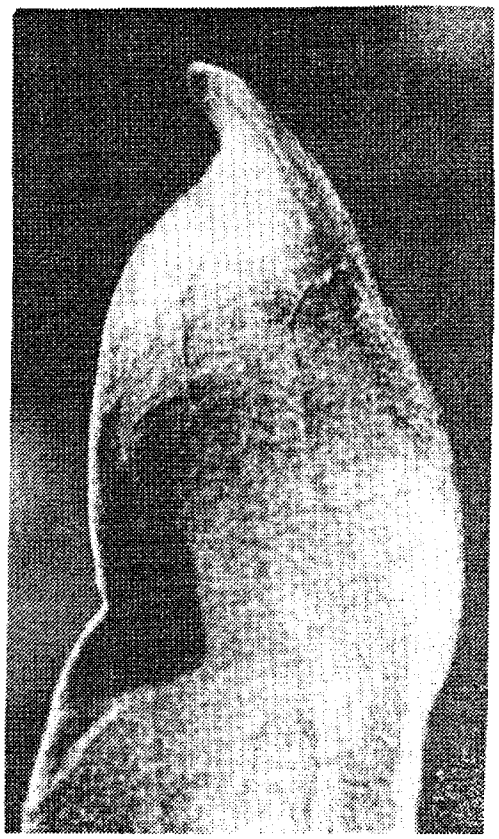


Fig. 10

Tip of fertile frond of *P. hillii* cv. Panama burned by insecticide.

2. Buying insecticides*

Since insecticide concentrations vary between brands and in different countries, and since ferns as a group are sensitive to insecticides, the safest rule is use them at half strength. Only with *Platycerium* which are in very high light where they are hard and tough, should even 3/4 strength be used.

Dealing with sensitive plants makes it necessary to read the ingredients of insecticides. It is not necessary to pronounce the long names to recognize those that are identical. Sevin is Carbaryl (1-napthyl N-methylcarbamate), the active ingredient of several insecticides, and flea collars, that do not say Sevin

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*All pesticides in this book with capital first letters are registered names.

on the labels. 0,0-diethyl 0-(2-isoprophy-6-methyl-4-pyrimidinyl) phosphoro-thioate is Diazinon.

Those who do not read ingredients can easily waste money buying more than one of the well-known insecticides which contain, 25.0% Diazinon, 54.4% aromatic petroleum derivative solvent, and 20.6% inert ingredients.

Petroleum distillates, or xylenes, are often used as carriers or solvents in insecticides. Since they also help kill the insects, they must be listed with the active ingredients. They are very harmful to ferns. Avoid them. Some inexpensive scale insect sprays are almost entirely petroleum distillates.

The inert ingredients, although a mystery, should not damage staghorns. Both Kelthane and Malathion can be purchased in solution with inert ingredients only, no petroleum distillates, or xylenes.

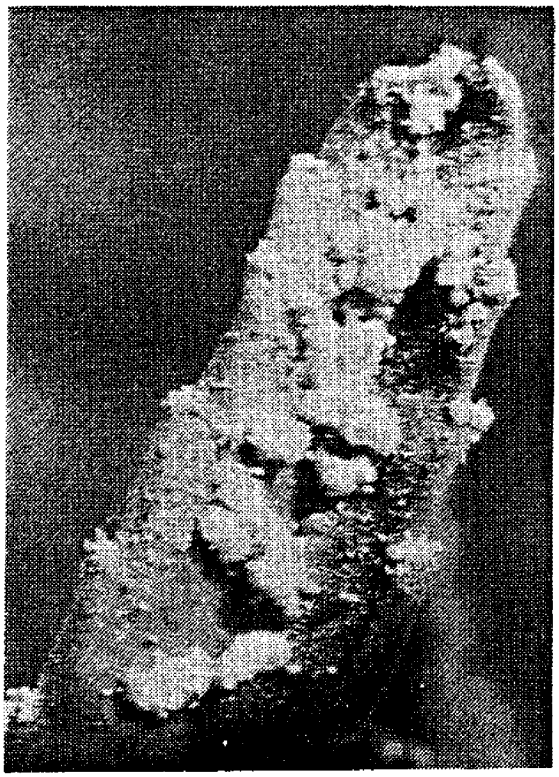
Malathion, Sevin, Diazinon, and Orthene are available as powders at feed stores, or landscaping nurseries. In this form they may be placed behind the moss before mounting the fern.

Malathion, Diazinon, Cygon, (Cygon is also available as a root drench) Isotox, Kelthane, Orthene, Sevin, insecticidal soap, and Black Leaf 40 are all used on staghorns.

3. Specific Insect Problems-

Of the larger insects, sowbugs and scales are problems on staghorns. Black Leaf 40 controls scales. Most other insecticides must be used at such concentrations to kill scales that they damage the ferns. Sowbugs hide during the day, but come out at night and eat the softest parts of the fern. Spray thoroughly and drench the sphagnum to kill those in it. Scattering granules of Diazinon helps control sowbugs.

Of the tiny insects, thrips and mites are common on staghorns. A 10X handlens is almost a necessity to locate them. They can be either dark, light, or silvery, and may be in the moss, on the dead shield



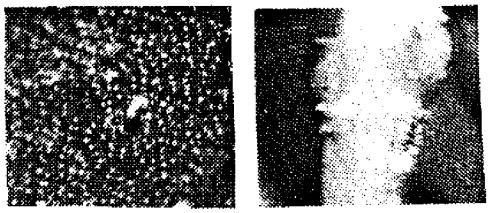


Fig. 11
Right- Mealybug found on a *Coleus*. In the early stages of an infection the whole animal shows.

Left- Scale, shown about actual size, found on a *Platycerium*.

Fig. 12
Mealybug, more advanced infection, on *Stapelia*. This stage is more often seen.

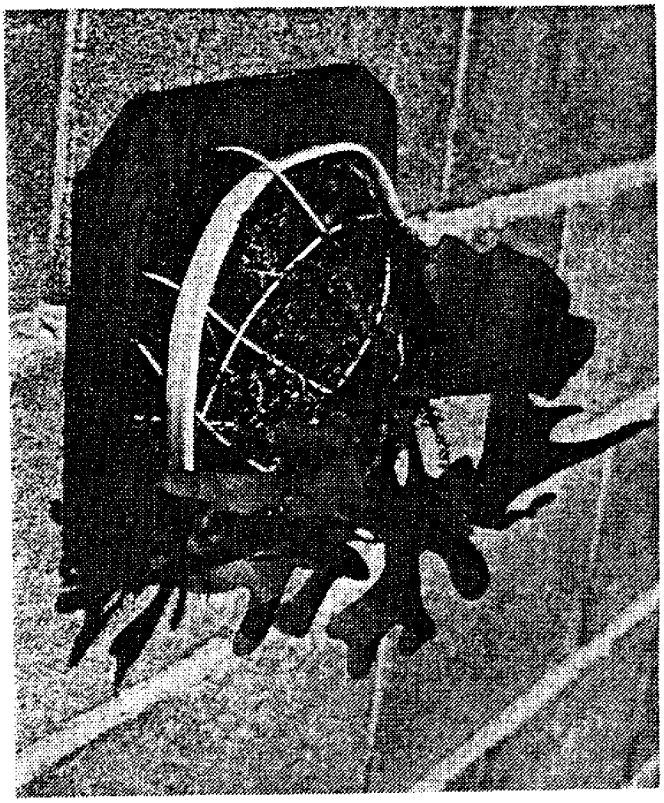


Fig. 13
A young *P. ridleyi*, looking very well, but doomed to die. Even with this large, white flea collar in place, the tip of the bud was eaten, probably by a sowbug. It took over two months for the plant to completely fade away.

fronds, or on the bud. Overwatering increases problems with these insects. Picking up the fern to inspect it may alert them. Then they hide. Drenching the sphagnum with Malathion, Sevin, or Diazinon kills them. Kelthane controls mites. If a staghorn is not doing as well as it should, these tiny insects are often the reason. Submersing plants one after the other in a container of water may spread them.

Fig. 14
Snow scale on the shield frond of *P. ellisii*. It is a pest in southern states where plants are kept in open locations.

Snow scale shows as small white tufts. It can be controlled using Blackleaf 40, followed by Diazinon, then Malathion, with only two days between sprayings. The white tufts remain, but inspection will show the insects are dead.

With a serious insect outbreak, or when plants are received heavily infested, repeated sprayings are needed to kill both the adults and the young from the eggs that will hatch later.

B. Fungi-

Control of fungi is the most consistent difference the author found between those who are successful with the difficult species and those who are not. One hobbyist related, "I don't keep *P. quadridichotomum* or *P. madagascariense* anymore, I have killed too many of them," and later said, "My place is the Fungus Capital of the World."

1. Preventing fungus problems-

Assume that any plant just received from across the country, across the ocean, or as a freshly cut pup, has sustained enough damage that fungus can start in it. Treat it with a spray or soaking of fungicide. Then watch it daily for any of the problems described in 3 below. Once a plant is established, overwatering is the single most common cause of fungus problems.

But even if fungus does not seem to be a problem, regular fungicide treatments, rotating among several types, are important since fungicides as a group tend to only control the growth of fungi rather than kill them.

2. Buying fungicides-

Unfortunately fungicides have many names. The common name is what the active ingredient is called on the label, the trade name is a registered name for that ingredient, and the product name is what the company decides to call its product. Sometimes the names are similar, but often they are very different. Here the common name will be used, but the first time it is used, trade names will be given immediately after it. Product names will be given only for fungicides that may be hard for the hobbyist to locate. Reading the active ingredients is essential when buying fungicides.

The water molds in the genera *Pythium* and *Phytophthora* are responsible for many of the fungus problems on *Platycerium*. Ethazol (Truban) and ethazol plus thiophanate methyl (Banrot) are recommended for them. Metalaxyl (Subdue 2E), is a relatively new systemic fungicide particularly good against water molds. It is currently available only in expensive agricultural quantities.

Of the commonly available fungicides, the author and others have used Benomyl (Benlate), chlorothalonil (Daconil 2787), captan, folpet (Phaltan), and maneb (Diathane M-22 Special) without problems.

Zinc ion plus maneb complex is more commonly known by the trade names Diathane M-45 and Manzate 200. It is often recommended, but not easy for the hobbyist to obtain.

Many other fungicides are available, however they are often for treatment of specific fungi on specific plants. Little is known about how effective they are on the fungi of staghorns. Also, fungus problems tend to be different in different localities, so if there are persistent fungi, it is best to both experiment with other fungicides, and give samples of the fungus to the state agencies that can help.

3. Recognizing and treating fungus problems-

This is practically an art. However, fungus problems can be divided into leaf fungus and rots.

a. Leaf fungus-

Leaf fungus is a problem in localities with hot, humid, and wet summers. It mainly damages fertile fronds. The advancing edge of the fungus is often yellowish, but the main fungus is brown or black. Benomyl controls many types of leaf fungus. What it does not control, chlorothalonil generally does. Air circulation is also an enemy of leaf fungus. Putting plants in front of a fan for a couple of days will dry fungus.

b. Rots-

Rots are a very different problem. They are most common on shield fronds.* The tissue turns brown or black and often has a semi-transparent look before it dies and dries up. Normal frond dying, described in (3) below, can look the same, but advances slowly. When not certain if the dying is moving fast enough to be rot, put a mark on the frond at the edge of the green. If the next day the dying edge has moved two mm (1/8 inch) or more into what was green the day before, it is rot. The rot situation is an emergency. Fast and drastic action is required. Control of rot is difficult because there are at least two types.

(1). Fungus rot-

There is no way to tell fungus rot from bacterial rot except by its response to fungicides. Try a general fungicide, benomyl, ethazol, chlorothalonil, or captan, and do all possible to get the fungicide

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*Rots may also start on the rhizome, but by the time they show at the bud it is usually too late to save the staghorn. They provide another reason to treat with fungicides even though fungus may not be visible, and to avoid overwatering.

into the very area where the rot is advancing. Use spreader-sticker, and even poke little pinholes into the tissue that is no longer green, but not yet dry, so the fungicide will reach the cells inside.

(2). Bacterial rot-

If fungicide does not stop the advance of the rot, then assume it is caused by bacteria. Antibiotics are available in soluble forms from feed stores. Terramycin is broad spectrum and inexpensive. When used at one teaspoon per gallon, with spreader-sticker it gives good results. Make a few pinholes, as for fungus rot. Other antibiotics are readily available.

However, if the rot still advances quickly after being treated with both fungicide and antibiotic, it must be trimmed out. Use a razor blade and make one long sweeping cut through good green frond ahead of

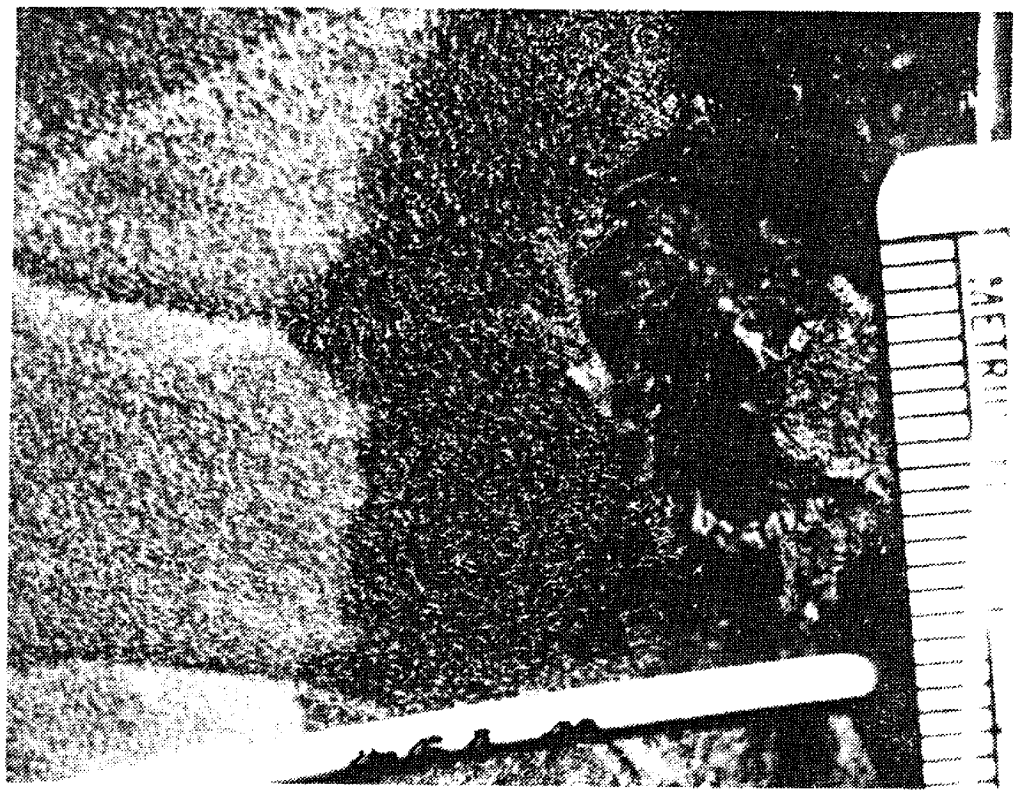

Fig. 15
Rot, in the shield frond of *P. elephantotis*, advancing toward the bud.

the rot and throw all the rotted area away. The cut green edge should be treated with fungicide and allowed to dry quickly.

(3). Normal frond dying-

In the late summer and through the fall several species of *Platycerium* normally allow their shield fronds to die and turn brown. *P. stemaria* truly kills its shield fronds and *P. elephantotis* may look a terrible mess.

This dying starts next to the bud and moves out, sometimes along the veins. Fungus rots and bacterial rots usually start at the edge of the shield and move rapidly toward the bud, or spread from a point of injury.

When uncertain, it does no harm to treat normal frond dying as though it were rot. It does not respond, and moves on slowly.

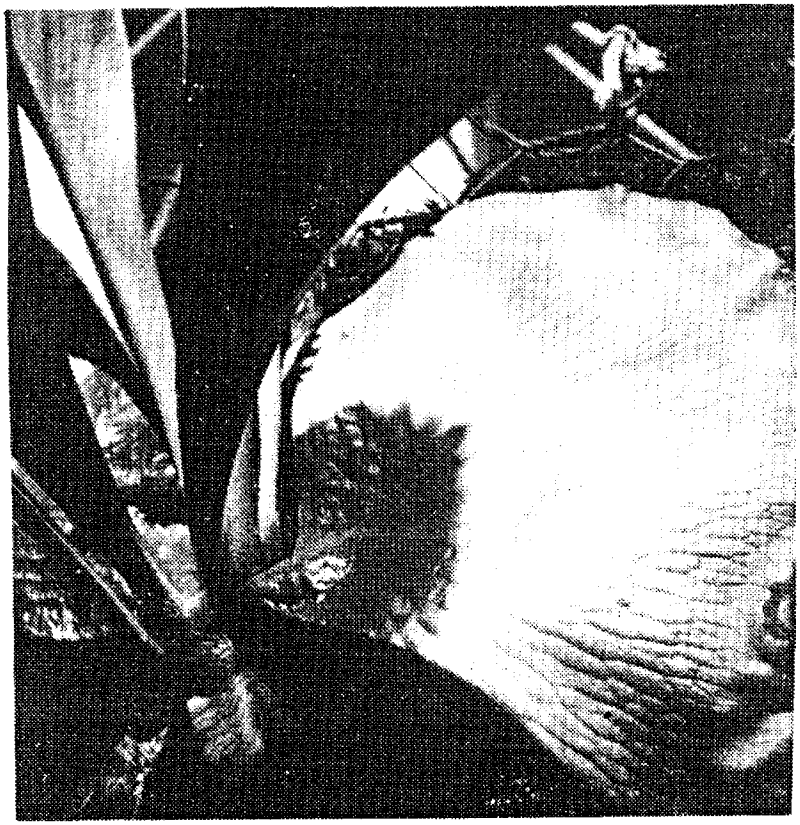

Fig. 16
Normal shield frond dying in *P. alcicorne*, starting at the bud and advancing toward the edge. The light part of the shield is waxy and yellow green. The dark part is brown.

IV. The staghorn needs fertilizer

Plants need nutrients. Watering washes nutrients away, which must be replaced. A standard fertilizer is Peter's 20-20-20, half strength during the spring, summer, and fall, and quarter strength in the winter. Too much fertilizer makes the fertile fronds very dark green, thick, tender and may cause the wide frond cultivars of *P. hillii* to show cracks or tears. Spraying the 20-20-20 along with the pesticides, as described below, gives the fronds nutrients. Pour some fertilizer solution through the sphagnum moss also.

Lack of iron (or too much sun) will cause yellowing of the fertile fronds. Chelated iron solutions are available. Few growers concern themselves with trace elements. There seems to be enough impurities in fertilizers to take care of the trace elements. However, Jerry Horne, a Miami nurseryman who successfully grows all *Platycerium* species, recommends the use of trace element compounds, according to label directions.

V. Staghorns need water

A. Water quality

1. Hardness:
The harder the water the more deposits it will leave on moss and shields. These deposits also form on the roots and interfere with their function. Lowering the pH, described below, is a method of making hard water usable because at pH 5.5 to 6.0, little hardness is retained by the roots or moss.*

2. pH:
Checking the pH of water tells how acid or alkaline it is. The lower the pH, the more acid it is, the higher the pH the more alkaline it is. At pH 7.0 it is neutral. The scale is logarithmic, meaning 5.0 is ten times as acid as 6.0, 4.0 ten times as acid as 5.0, so 4.0 is 100 times as acid as 6.0.

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*The author's shallow well gives very hard water, 66 grains, so the only practical water source is the rain. With only 18 cm. (7 inches) per year, it is necessary to save rainwater in a group of used aquaria. A home-made automatic watering system pumps it from this reservoir through plastic tubing to the ferns. Fertilizer is mixed into the water reservoir and the automatic feature makes even vacations possible without asking someone to water the collection.

It is measured with papers that change color. Since slightly acid, 6.5, is considered ideal for watering and mixing sprays, a pH paper which reads between 4.5 and 7.5 is ideal. This paper is usually available in rolls at drug stores. Biological supply companies carry many pH papers.

Lowering pH can be done with vinegar, acetic acid, or phosphoric acid. Acids sold with plumbing supplies may be used, but they tend to be highly concentrated, dangerous chemicals. When lowering pH the rule is, add acid TO water, add the more dense to the less dense.

Raising pH is most often done by adding baking soda, but this tends to form deposits on the shield fronds later.

If there are no problems due to pH, it is best to not adjust it. Rainwater here is about pH 5.5, rather acid, but the *Platycerium* take it fine. The pH of city water tends to be rather constant, so it needs checking only rarely.

B. Water amount

Many plants are killed by overwatering. Those species truly sensitive to overwatering are noted in Chapter 4. Most species can do well on far less water than most growers use, particularly in the winter. During the growing season the sphagnum moss should be moist but not wet, during the winter, barely moist.

New moss tends to dry out quickly on the surface and then water runs off it rather than entering.* Completely submersing the staghorn in a tub of water assures that water gets to all roots, but it may transfer pests from plant to plant.

How to keep the proper moisture is a problem that must be solved for each location. No plant roots will grow through dry material. Since the buds for pups form from the roots, if the outside of the sphagnum moss is always dry, no pups form. The moisture level in a little pad of sphagnum is harder to control than in a bigger one. Fungus problems are often caused by overwatering. A dark green coating of algae over the moss is a sign of too much water.

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*Wetting agents, such as Aqua Gro, help solve this problem.

C. Water temperature

Water from pipes located in exposed places can give the roots quite a chill in the winter, and a scalding in the summer. This can be a mysterious cause of problems with *Platycerium*.

VII. The staghorn must have the proper environment-

A. Light

When in low light many staghorns produce long dark green fertile fronds, referred to as 'soft growth.' Their weight alone may cause them to hang down, but when given more light the same plants grow their fronds shorter, stiffer and upright. Suggestions for the different species are in Chapter 4.

The shape and surface of the fertile frond can be clues to the plant's light requirements. A covering of hairs protects the surface from intense light, and helps reduce water loss. It is the cause of the grey-green leaves of many desert plants. *Platycerium* with this covering require higher light conditions than those that are nearly naked and dark green. Narrow leaves allow much of the available light to pass by them, and they lose their excess heat faster because they have a greater surface-to-volume ratio than wide leaves. So, when two staghorns are received, one with narrow fuzzy fertile fronds, and the other with wide dark green fertile fronds, the first should be given a brighter location than the other.

A shiny, waxy coating on the fertile fronds is another adaptation which prevents water loss under high light. *Platycerium alcicorne* and *P. ellisii* both have it. Because of its narrower fertile fronds, *P. alcicorne* should be able to take higher light than *P. ellisii*, which seems to be the case. In Miami, *P. alcicorne* does well in full sun, but *P. ellisii* requires some shading.

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*In this book, high light level means taking a photo with ASA 25 speed film, at 1/50 and *f* 5.6, and low light level means 1/25 at *f* 4.0 with the same film.

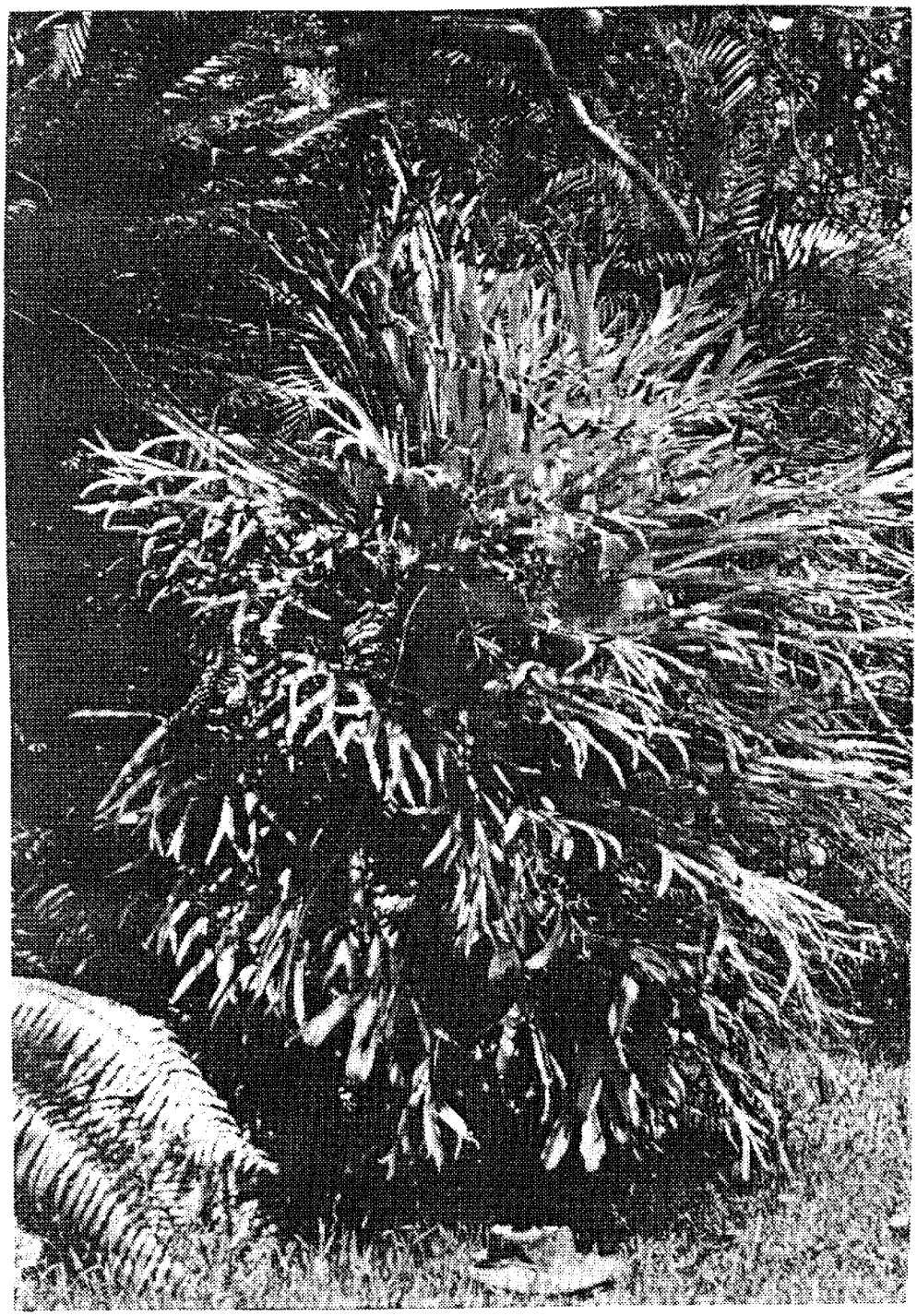

Fig. 17

P. alcicorne thriving in full sun in a yard in Miami. The central support is a treefern pole. The hat is for size.

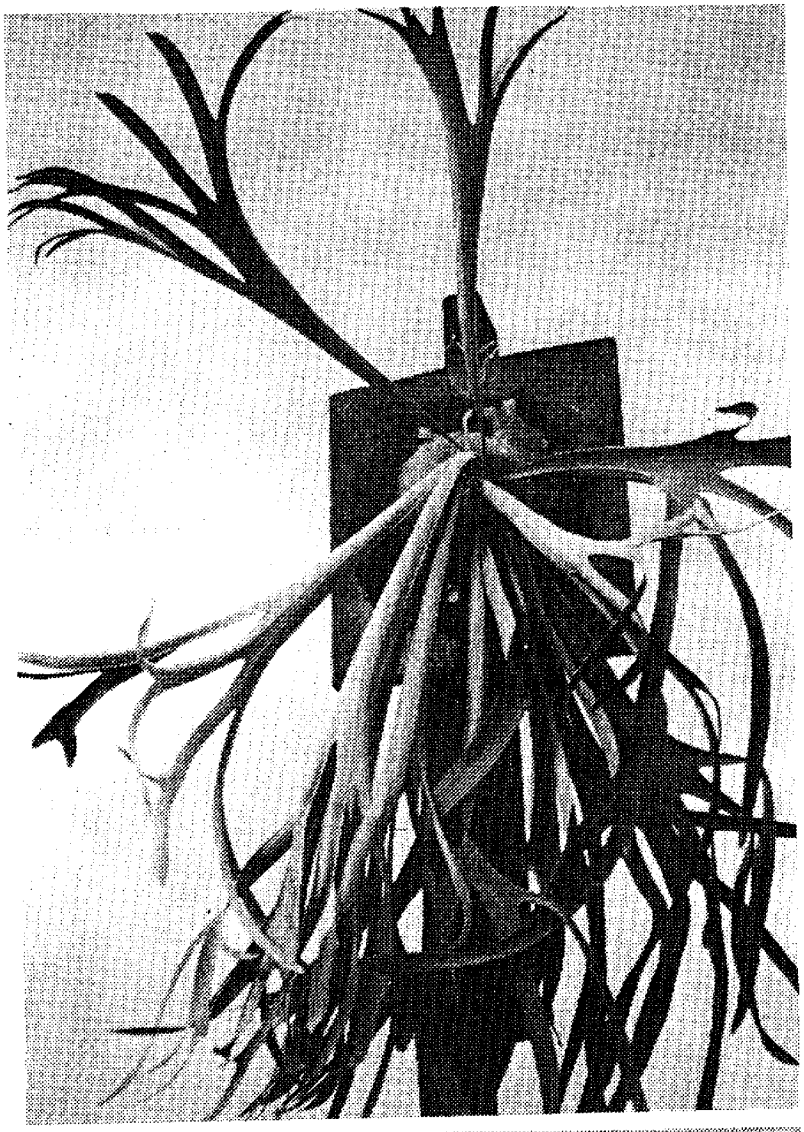

Fig. 18

P. veitchii cv. Lemoinei grown under low light conditions. The fertile fronds are long and only the young smaller ones can support their own weight in an upright position. There are no spore patches.

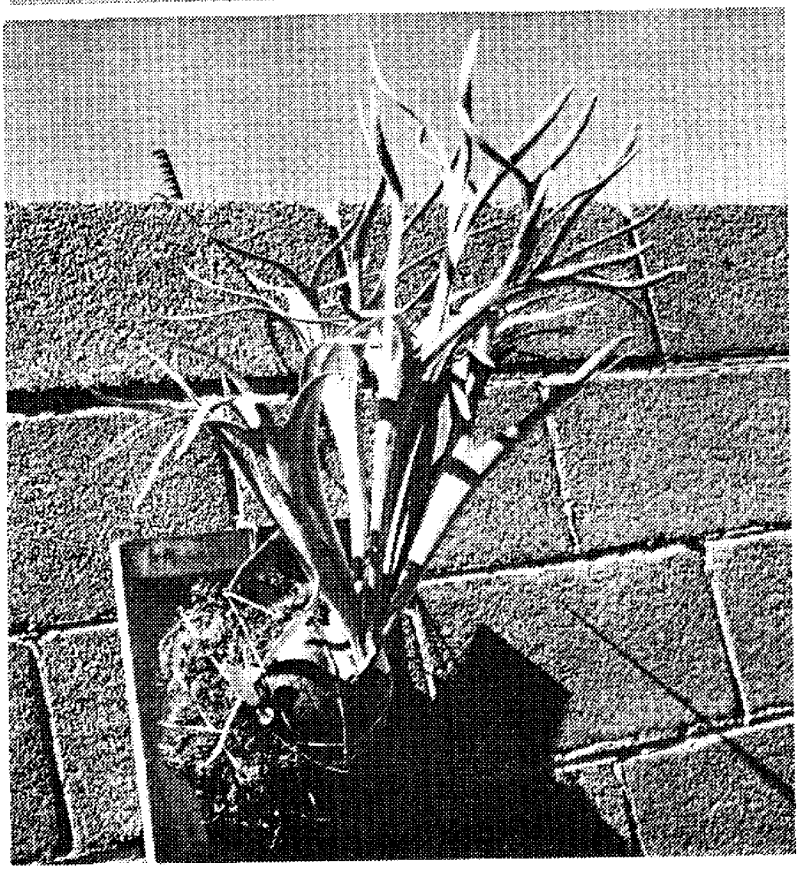

Fig. 19

P. veitchii cv. Lemoinei grown under high light conditions. The fertile fronds are shorter and upright. There are many spore patches. Not only is it the same cultivar as above, it is the same plant, 18 months later.

Light level has profound effects on spore production. As an example, my greenhouse has two main light sources, the roof, which slopes slightly to the north, and the south wall. In the summer much light comes through the roof, little through the south wall. In the winter, much light comes through the south wall, little through the roof. Staghorns hanging near the roof produce fertile fronds with spore patches in the summer but without spore patches in the winter. Staghorns hanging next to the south window form spore patches in the winter, none in the summer. If staghorns do not form spore patches, increasing the light may start them.

B. Temperature

Most staghorns do not do well with long periods over 35 degrees C (95° F). Most growers do not keep plants near their minimum temperature. The practice is to play it safe, particularly with growers just starting with staghorns. Most who have kept staghorns for years are less afraid of short periods of low temperatures. Jerry Horne says all *Platycerium* species can take down to 4.4 degrees C (40° F). The lowest temperature staghorns can take is very dependent on the amount of moisture in the plants and the air. It is not known if cool temperature during dormancy is beneficial.

C. Air circulation

Staghorns generally benefit from good air circulation. With difficult species, air circulation could be the difference between success and failure.

D. Humidity

The general rule is over 50%. If this is not possible, misting staghorns helps them greatly. Many growers add fertilizer to misting solutions.

VIII. Chemicals must be applied to staghorns properly-

A. Mixing

Sprays should be used as soon as mixed. Mix only what is needed, or use the extra on some outdoor plants.

A measuring error in a large batch of spray does not change the concentration much but a small measurement error when mixing only a half gallon of spray can burn staghorns. Measure very carefully.

New sprays are best first tried on test plants. A young *P. stemaria* is a good choice. Better lose it than an entire collection of *Platycerium*.

It is impossible to remember the mixing amounts for every spray. Calculating the amounts from the label each mixing time increases the chance of making an error so greatly that it is nearly certain eventually one will be made which will do great damage to the collection. Hang a chart with the names of the sprays used, someplace where it will not be damaged, and write next to each name the amount to use when mixing.

It is also impossible to remember which sprays were used on what dates for a whole year. It is important to keep a calendar record of spray applications.

B. Additives

Spreader-sticker is to help the spray stay on the fronds. One teaspoon per gallon (5 mL per 3.785 L) of Physal 20, a commercial sanitizer, is recommended because it not only acts as a spreader-sticker, it helps control algae and fungi. A few drops of mild liquid dishwashing detergent will work but is not as good.

Five drops per gallon of Superthrive helps root growth, which gives sturdier plants. Superthrive is also used for soaking newly received staghorns if they arrive in poor condition.

C. Combinations

It saves time to mix insecticide, fungicide, food, Superthrive, and spreader-sticker as one solution and spray it as a single spray, about every 10 days or 2 weeks. Jerry Horne has done this for years; some others advise against it. Truban fungicide should not be mixed with insecticides.

This chapter has dealt with a great number of topics, each a part of cultivating *Platycerium*. They may seem complex, but their application becomes routine. The larger the *Platycerium* collection, or the more species it contains, the more important it becomes to keep track of the variables discussed here, and apply the methods for keeping them under control.

All the items in this chapter can be combined into one comment: use good horticultural techniques. Become lax and the plants suffer. All species of *Platycerium* can be grown by the person willing to use good horticultural techniques.

For additional reading-

Chase, R. A., Diagnosis of Foliage Plant Diseases, University of Florida, IFAS Agricultural Research Center-Apopka ARC-A Research Report RH-82-8 1982. An article from a talk, has four tables, two of symptoms, two which compare fungicides used as sprays and soil drenches. Loaned to this author, difficult to locate.

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Hoshizaki, Barbara Joe, Fern Growers Manual, Alfred A. Kompf, New York, 1975. The standard classic.

Hughes, Ralph H., Cold Hardiness Zones for Staghorn Ferns in Florida. Rhizome Reporter, 1982, 9(1):6-8 An interesting and careful study of *Platycerium* grown outside in 4 zones, commented on by Chris Goudey, Rhizome Reporter, 1982, 9(3) :17-20.

Mickel, John, and Fiore, Evelyn, The Home Gardner's Book of Ferns, Holt Reinhart and Winston, 1979

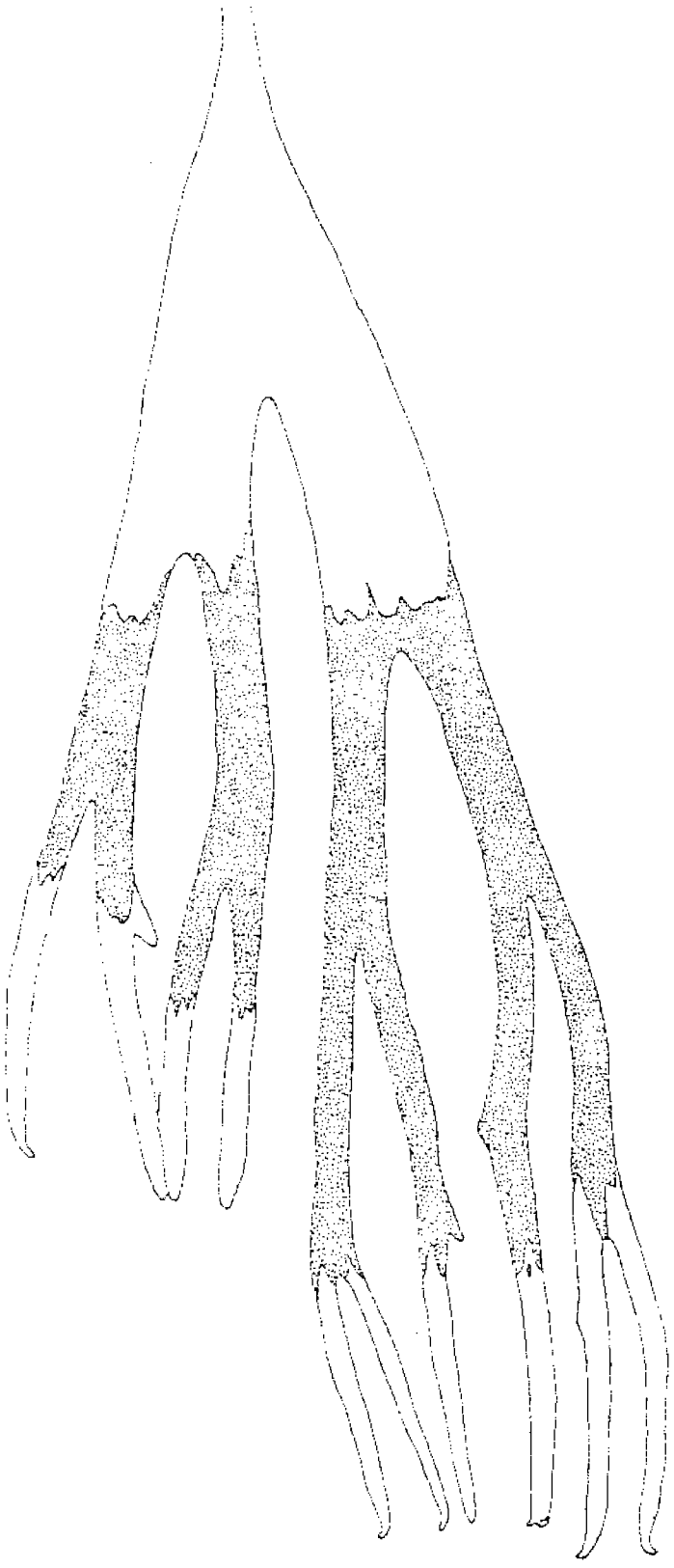
Simone, Gary W., Fungicides for Use on Ornamentals 1983-1984, Florida Cooperative Extension Service, Circular 484-A, University of Florida, Gainsville, 1983. Contains charts of plants, their fungus diseases, and what fungicides to use. The only fern is Leatherleaf Fern. In the back are addresses of chemical manufacturers.

Fig. 20

A young *P. holttumii*, ravaged by rot which started in minor shipping damage, before the author learned of using antibiotics against rots.

Fig. 21

Part of the shield frond of *P. elephantotis*, eaten by a sowbug.



P. andinum

CHAPTER THREE: Propagation

Platycerium are propagated in three ways; tissue culture, pups, and spore culture.

A. Tissue Culture-

Tissue culture works because the nucleus of each living cell of the plant has a complete set of the genes necessary to form the whole plant. All the gene sets of one plant are identical, so, under the proper conditions, any of a plant's living cells should be able to grow into a whole plant. The resulting plants should be genetically identical to the starting plant.

Laboratory culture of plants from single cells began in the early 1960's. Now the laboratories are major suppliers of plants for the nursery trade. However, starting with only one cell is not necessary. Typically a group of cells called an explant is removed from the parent plant and surface sterilized. When placed on the proper medium it can be grown into a lump of cells called a callus. The callus can be maintained indefinately or can be caused to grow buds which are cut from it. These are grown in the lab, then transferred to soil. The total process does not take less time than other propagation methods, but once the callus is formed, large quantities of identical plants can be produced in a small laboratory.

Since *Platycerium* are a very minor part of the nursery trade, only a few labs, mostly in California, tissue culture them. *Platycerium bifurcatum* cv. Netherlands, *P. veitchii* cv. Lemoinei, *P. hillii* cv. Pumila, and *P. superbum* are the main subjects of current tissue culture efforts.

It was discovered pup-forming *Platycerium* can be tissue cultured very simply. Putting plantlets from test tubes into a chopping blender for five seconds resulted in many pieces which themselves would grow into new plants. This cut the labor cost for producing *Platycerium* greatly. Now one large laboratory could cover the earth with *Platycerium*.

Fig. 22

A bench of tissue cultured *P. hillii* cv. Pumila growing potted until put on plaques. Porter's Tropicals

However, some dealers and hobbyists take a dim view of tissue culturing *Platycerium*. They contend that tissue cultured plants are so conditioned to the sterile laboratory that they do not last long outside it, and that the chemical control their genes have been through tends to make them grow abnormally later. They also feel that many who bought the inexpensive tissue cultured *Platycerium* had bad experiences with them, which resulted in a general decrease of interest in staghorns. But those who sell tissue cultured *Platycerium* claim they grow normally, that they have the same genes for disease resistance as those not grown in the lab, and that producing them any other way is so labor intensive their price would be more than the hobbyist would pay, meaning they could not carry *Platycerium* at all.

The result is, the large competitive production nurseries have tissue cultured *Platycerium* if any, and the smaller, more casual, backyard specialty nurseries have pups, imports, and sporelings. The final word on the value of tissue culturing *Platycerium* is not in yet.

B. Pups-

Of the pup-forming species, all but *P. coronarium* form pups from the tips of roots which reach the surface. Pups first show as tiny buds.

Removing pups-
The most common mistake is removing the pup when too small. The pup should have shields at least 1/4 the size of the parent's before removal. Use a sharp knife, cut back into the moss and take out the pup with a good start of roots. Put some new moss in the hole, so the next set of shields from the parent plant can cover it.

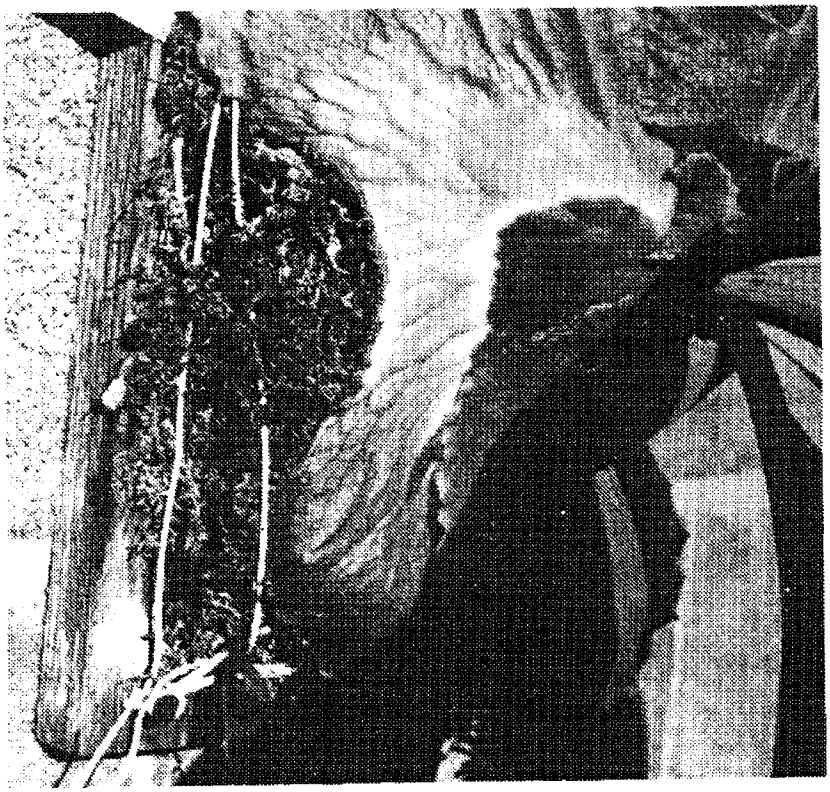
It is almost always necessary to cut the shield of the parent plant when removing a pup. There are less chances for infections if the shields are brown and dead. If green shields must be cut, spray fungicide on the cut edge, and let it dry quickly.

The pup is usually at home on its own plaque, but if there are several very small pups, mounting all on the same plaque makes it easier to control moisture in their moss. A treatment with Superthrive or Vitamin B_1 helps their roots form.

Saving every pup is not practical. Some buds may have to be removed so others can develop normally.

Of the common species that form pups easily from their roots, the author finds those of *P. elephantotis* the hardest to remove successfully. It is particularly important for the pups of this species to become fairly mature before being removed.

Increasing pup formation-
Although it defaces the plant some, growers who want to encourage pup formation will take a screwdriver and poke holes through the shields all the way to the plaque to provide pathways for the roots to grow to the surface and form pups. It works.



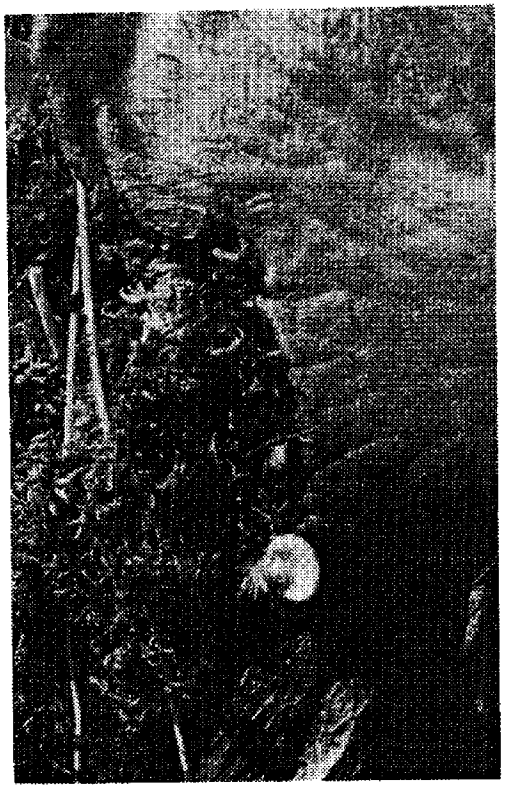


Fig. 23 (above)

The hole left when a pup was removed from *P. andinum* is filled with moss, held in place by wires.

Fig. 24 (left)

The same *P. andinum* the next spring. The shields have died and pups are forming along their edge.

The amount of moss available has an effect on pup formation. On a plaque with extra moss, pups can form around the edge. In a basket only 6 to 8 cm.(2 to 3 inches) wide, pups tend to come quickly out the back.

C. spore culture

It is usually five to ten years from the day *Platycerium* spores are put down to the day spores are collected from the new plants. Although this is a long time, spore culture widens the hobbyist's understanding and appreciation for these ferns. It is an interesting process.

Some species can only be grown from spore. Having spore-grown *P. grande, P. holttumii, P. wallichii,* or *P. ridleyi* can make trading very easy. Plus the truly exotic new cultivars will no doubt only come by selecting for specific traits among sporelings over several generations.

There is not a single best spore culture method for everyone. However, in every culture the plants must go through the same stages, and the grower must provide the environment where they can.

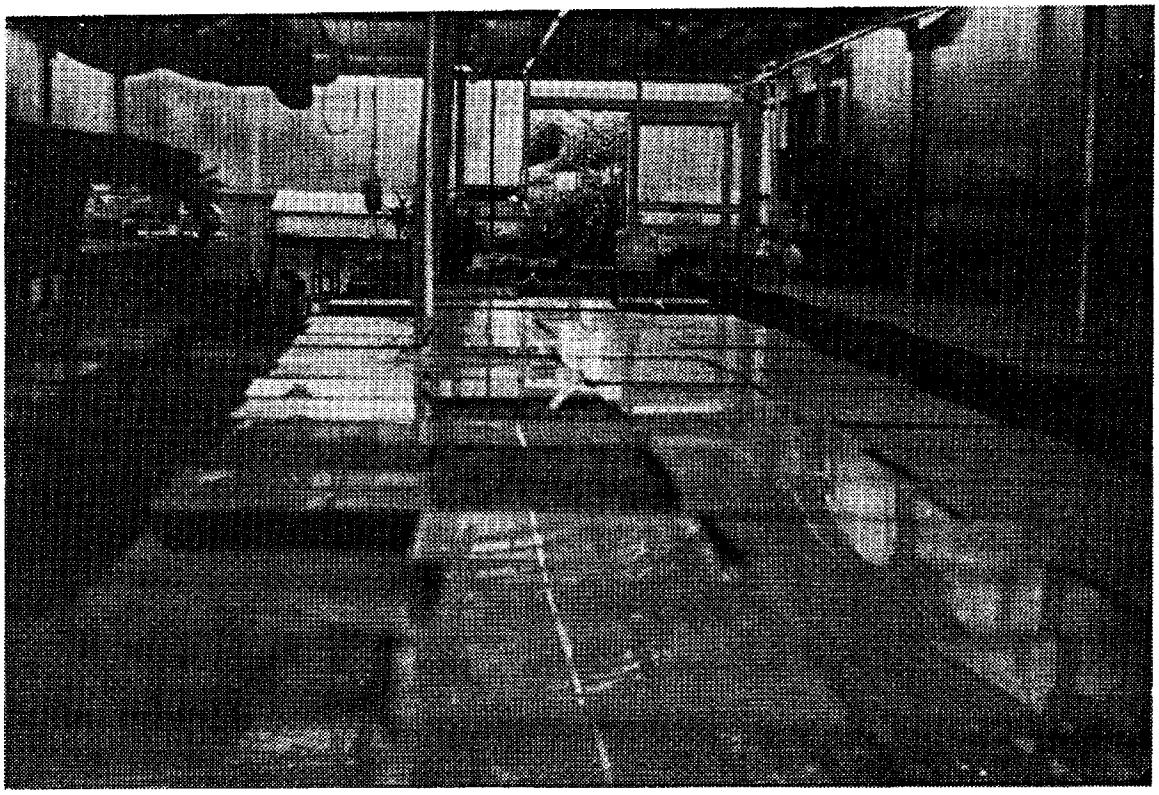


Fig. 25

The spore room of Porter's Tropicals, showing many flats with glass covers.

I. Environment:

A. Light
Sunlight is often used, with protection from overheating. Regular fluorescent tubes are used by many. Although less light is used very successfully, most directions indicate at least 100 foot candles (two 48 inch fluorescent tubes at 12 inches). No dark period is needed by the plants.

B. Growing medium
Since *Platycerium* will volunteer on the sides of trees, rocks, and flower pots, the ferns themselves must not be too particular. Most growers use equal parts of milled peat moss and perlite, or milled sphagnum and perlite. Many use Jiffy-7 peat pellets. Others use peat moss with leafmold and sand, or loose potting mix and charcoal, or Kitty Litter, or perlite alone. Mr. Cass used a boiled red brick.

C. Humidity
The rule is, as high as possible for spore germination. This means some sort of moist chamber, like a flat with a glass plate over it, a deep covered petri dish, a plastic glass inside a plastic bag, a plastic shoe box, or other set-up.

D. Temperature
The temperature range for mature plants works for spore culture; however, less fluctuation is safer.

E. Sterilization
Without sterilization of the medium, the author has always had fungus growth. Some growers sterilize with pressure cooker, 20 lbs at 20 minutes, or with dry heat in an oven, 150 degrees C. (300 degrees F.) for 20 minutes. Microwaves can be used. Surfaces are sterilized with 10% Clorox and washed with boiled water. Peat tends to not support fungus growth and may not need sterilization. As a general rule, sterilization is best.

II. Stages:

A. Getting spores
Platycerium form spores inside sporangia, on large spore patches. When mature the sporangia push their way through a layer of stellate hairs and turn brown, except in *P. wallichii* where they stay green. The final stage is when the sporangium becomes mature and dry enough to pop open, throwing the spores into the air.

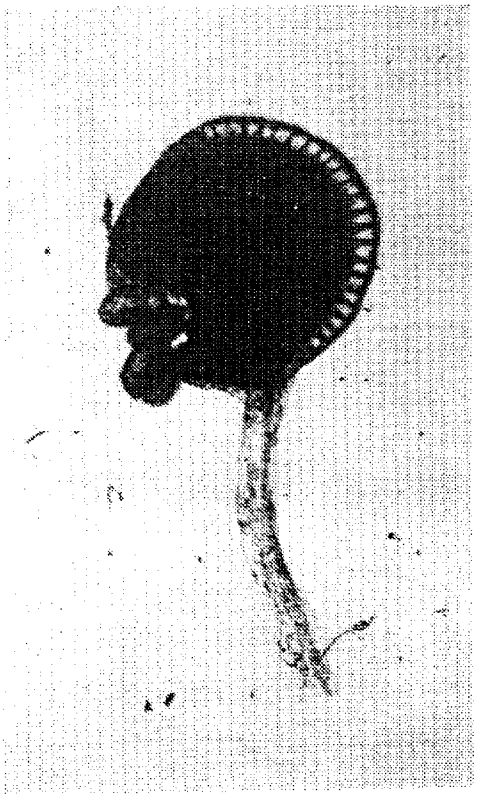


Fig. 26

Microscope view of the sporangium of *P. wallichii*, not yet open.

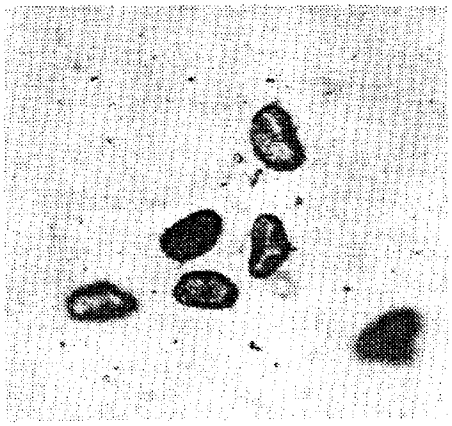


Fig. 27

Microscope view of the green spores of *P. wallichii*.

All the sporangia in a spore patch will be at about the same stage, but it takes 10X to 20X magnification to be sure what stage. If the sporangia are mature, the spore may be caught by: removing part of the frond and letting it dry in an envelope, by laying the fertile frond spore patch down on a piece of white paper where the spores will show as brown dust, or by scraping the whole spore patch off.

No matter how it is done, there will be a mixture of spores, pieces of sporangia, and possibly stellate hairs. The spores may be separated by moving the whole mass around carefully on a piece of paper, or by straining them through #20 plankton mesh or nylon stocking material. Sowing both sporangia and spores works; the stellate hairs are best removed. Spores can be sterilized with 10% Clorox solution in a jar, separated from the Clorox solution on a coffee filter and washed with boiled distilled water. After drying they are ready to sow.

B. Sowing spores

Often spores are put down too densely. One method is to put the dry spores in a small jar, stretch nylon pantyhose material over the mouth, and shake the spores onto the medium.

The green spore of *P. wallichii* should be sown as soon as possible after collection since green spores do not live long. Most people sow spore in the fall, the season most are available. Label every culture with name and date.

C. Green mat

One short green filament is formed from each spore. This forms a green mat. Some growers transplant sections of the green mat which causes it to spread more. Usually the green mat forms quickly. In some cases it is not a distinct stage.

D. Prothallium or gametophyte

From each green filament a flat, green, heart-shaped, 1cm (1/4 inch) tall, prothallium, or gametophyte may grow. It has half the gene number of the plant the spores were taken from and its function is sexual reproduction.

The sperm of ferns must swim to the egg, which means little droplets of water must be present.

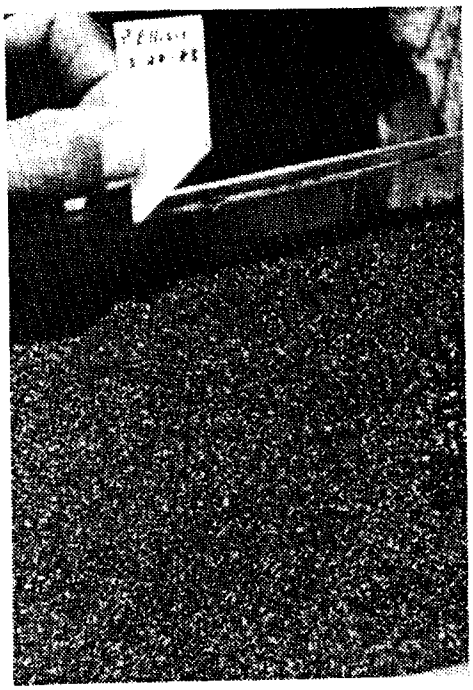


Fig. 28

A mat of prothallia or gametophytes from spore of *P. ellisii*, growing in a glass dish. A plastic cover was removed for the photo. This grower sprayed insecticide onto the lower surface of the plastic cover, only when insects were seen. These were sown so thickly some should be transplanted.

Most growers transplant the prothallia, finding they grow faster with space between them, and that more green mat will develop where they were taken out. Usually prothallia show from three weeks to three months after the spores are sown.

E. Sporophyte

The young staghorn is called the sporophyte. It develops from the fertilized egg in the prothallium which then dies. All this is a gradual process. The first sporophyte fronds may look nothing like the mature ones. Most growers transplant the young sporophytes as soon as they appear among the prothallia. As sporophytes are removed more form. A crop of prothallia may produce sporophytes 2 or 3 years. The young sporophytes, while still in the moist chamber, may pup very freely. *P. ellisii* even forms pups from the edges of its sheld fronds.

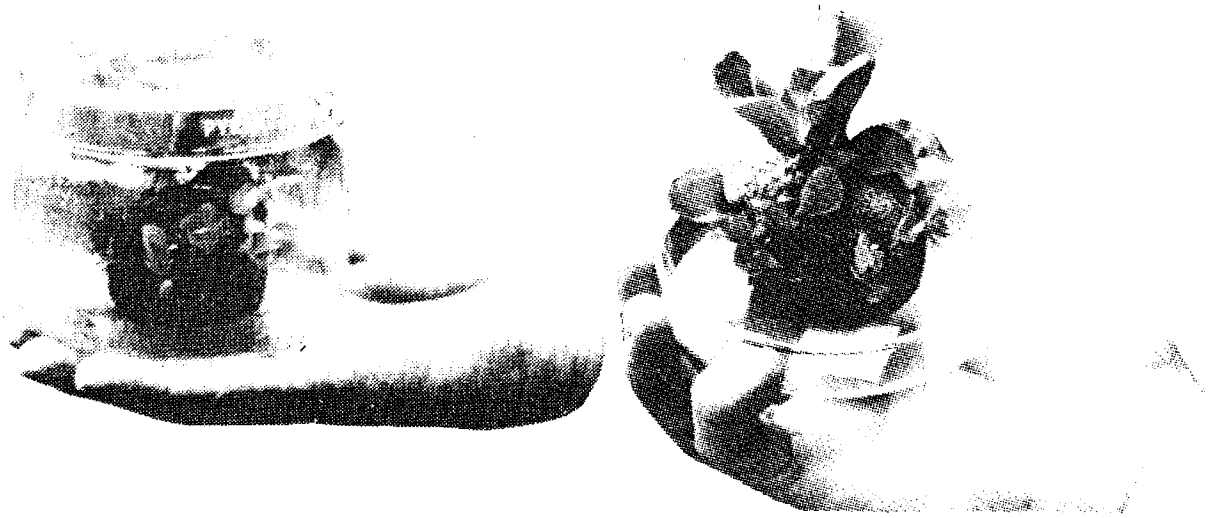


Fig. 29

Left, a moist chamber formed by a deep petri dish. Inside is a Jiffy-7 peat pellet. Right, the peat pellet has been removed and set in the top of the dish. The staghorn, *P. quadridichotomum*, has formed pups through the sides of the peat pellet.

F. Hardening

As the sporophyte develops it must be gradually hardened to conditions outside the moist chamber. This is the most difficult period in spore culture and there is no magic formula for doing it successfully. It takes weeks, not just hours or days. The protective covering of the moist chamber is gradually taken away. Very young *Platycerium* are often transferred to pots until large enough for their mounting.

III Problems:

A. Algae and fungus growth

Beginning sterilization of the medium should eliminate these. Peat mixtures and peat pellets are relatively free of algae and fungi. Excess light promotes algae growth, darkness favors fungus. For control, Banrot, or other fungicides may be misted, or the plants may be moved away from a large mass of fungi.

B. Insects

Fungus gnats are considered the worst insect pest. They are tiny and look something like flies. Their larva stage is worm-like and can destroy the prothallia. Diazinon, free of petroleum distillates, can be used on the prothallia to kill these insects.

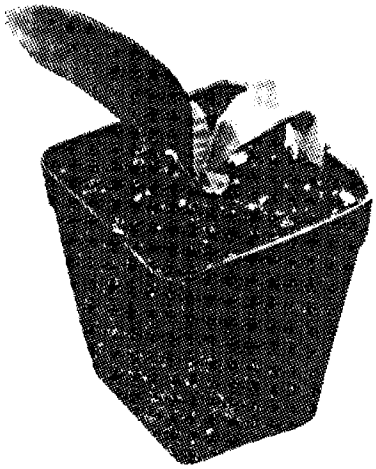
Fig. 30

Looking down onto a flat of sporelings of *P. ridleyi*, at Porter's Tropicals.

C. Growth problems

Most common of these is remaining in the prothallium stage too long. The record seems to be six years. This may be due to the sperm not being able to swim to the egg because there is not the water they need. Misting should solve this. One grower considers vitamin B_1 important to the change from prothallium to sporophyte and mists with a concentration of one 50mg tablet in a litre (quart) of water.

Spore culture has been described here in detail, and may seem complex. However, the most demanding part is making the beginnng set-up. A simplified method would be: put a Jiffy-7 peat pellet in a jar, pour boiling water over it. Then wash the spore with 10% Clorox, rinse them with boiled water, put them on the pellet, seal the jar in a plastic bag with a label. Leave it in a light place and watch it go through the stages until little plants that look like staghorns are well developed. If no heart-shaped prothallia show in 3 months, start another culture, but don't throw the other one out for a year. No matter how it is done, there is a type of pride in a plant raised from a spore, a beginning that is only one cell.



For additional reading

Cooke, Ron C., 1979, Homogenization as an Aid in Tissue Culture Propagation of *Platycerium* and *Davallia*, HortScience, Vol. 14(1) 21-22

Gmoser, Jerry, 1979, Aseptic Spore Culture, LAIFS Journal, Vol. 6(4&5) 101-108, 135-142. Two part article on a very productive method for growing *Platycerium*.

Hoshizaki, Barbara Joe, 1979, Fern Growers Manuel, Alfred A. Knopf, NY. Pages 72 and 73 give instructions on how to cross ferns, using the gametophyte stage.

Articles on topics in this chapter appear regularly. The LAIFS Bookstore has many short papers.


CHAPTER 4
SPECIES

Introduction:

The species of the genus *Platycerium* are treated here in alphabetical order. Their natural groupings are shown on page 1. Changes in the taxonomy of *P. bifurcatum* proposed by Hennipman and Roos, although they may best show the situation in nature, are not used here because the author feels they are too complex to become common in the hobby or the trade. However, they are noted with the species affected.

Maximum and minimum temperatures the different species can take will vary greatly due to the amount of moisture in the plant, the amount of moisture in the air, and how actively the plant is growing. With the rare and expensive species, neither hobbyists nor dealers are willing to subject their plants to unusual temperatures just to find their maximum and minimum temperatures. Also, the temperature ranges in the natural habitats are not known for all species. For these reasons, in this chapter temperatures are given only by how one species compares with another, rather than as specific numbers.

Other authors have listed small islands in the distributions of *Platycerium*. It is nearly impossible to verify that *Platycerium* are on small islands, or how they got there. Marcel Lecoufle checked "documents and vegetations" and concluded the *Platycerium* on La Reunion and Mauritius were introduced by early navigators. This author has tried for three years, without success, to obtain *Platycerium* from the Seychelles to verify that they are *P. alcicorne*. It seemed best to include here only the major area of distribution for each species.

Although different species of *Platycerium* require different treatments, there are no real "secrets" to growing the exotic species. The best advice was given at the end of Chapter 2: "use good horticultural techniques."

Platycerium alcicorne

(al-ci-corn-ē)

The correct species name for *P. alcicorne* has been the subject of disagreement between C. V. Morton and G. J. De Joncheere. Morton has passed away, and De Joncheere's position has been adopted by E. Hennipman and M. C. Roos. There seems to be no botanist convinced that the name *P. vassei*, as Morton contended, should be used in place of the name *P. alcicorne*.

The plants in the U. S. trade fall into two groups. The more common are those from Africa, the less common those from Madagascar. The African plants have a very characteristic yellow-green color, and are waxy with nearly no hairs. Their shield fronds turn rich brown when they die. They have been pictured on pages 20 and 24.

The Madagascar plants tend to be dark green, with many hairs. Some individuals have fertile fronds that are dark green on top, and on the underside nearly white with hairs. Their shields become nearly black when dead. The Madagascar plants characteristically develop folds in the upper half of the shields, if given enough light.

Fig. 31

Folds in the upper half of the shield fronds of *P. alcicorne* from Madagascar.

Fig. 32

P. alcicorne, Africa form in a basket. Each fertile frond shows two or three divisions and often shows folding at the center of the first division.

The Madagascar plants also divide into a form with wide fertile fronds and a form with narrow fertile fronds. The youngest fertile fronds of both tend to be wide. The amount of light affects their width somewhat, but extremely narrow ones tend to also have more pronounced veins on their shields. The author has traced virtually all the narrow forms to importations from Marcel Lecoufle (See page 157).

Much of the Africa and Madagascar range of this species is nearly out of the tropics, which must be responsible for its very seasonal growth. Shields die in late summer, and are dark brown through the fall and winter. Much of the winter it is dormant. Water and fertilizer should be decreased during these months.

The Africa plants are somethat less tolerant of excess water than the Madagascar plants. The Africa plants also pup more freely, but either eventually forms a cluster. Both types are slightly more sensitive to cold than *P. bifurcatum*.

Marcel Lecoufle's description and discussion of this species in about 1965 leads this author to conclude that the African form was not in cultivation in Europe at that time.

This species offers no unusual problems in cultivation, and is both pretty and interesting.

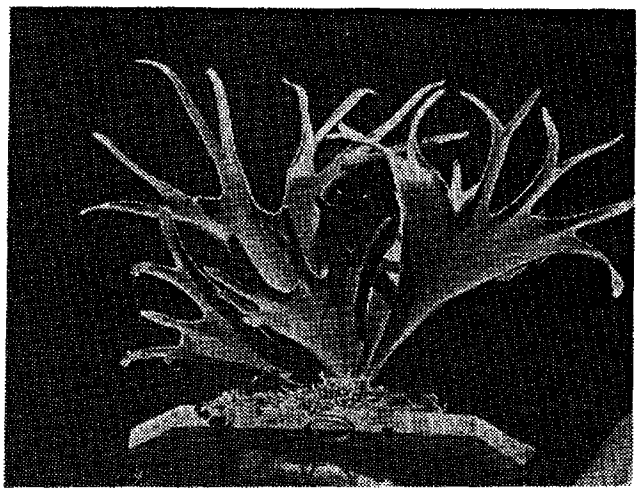


Fig. 33

Wide form of *P. alcicorne* from Madagascar, viewed from above.

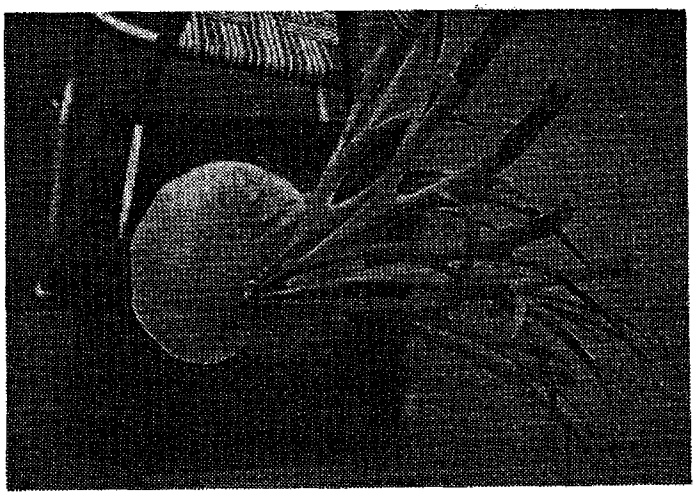


Fig. 34

Narrow form of *P. alcicorne* from Madagascar. The spore patches show as well as folds on the upper part of the shields.

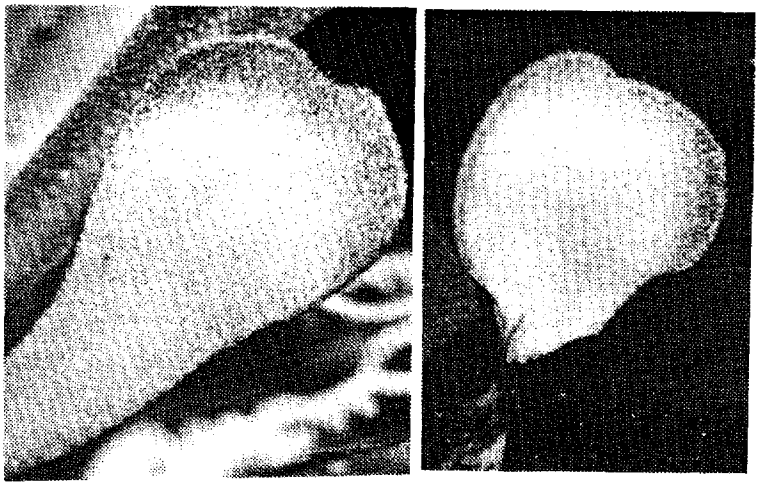


Fig. 35

Remarkable similarity of the young fronds of *P. alcicorne*. Left is the Africa plant from Fig. 32, right, a Madagascar plant.

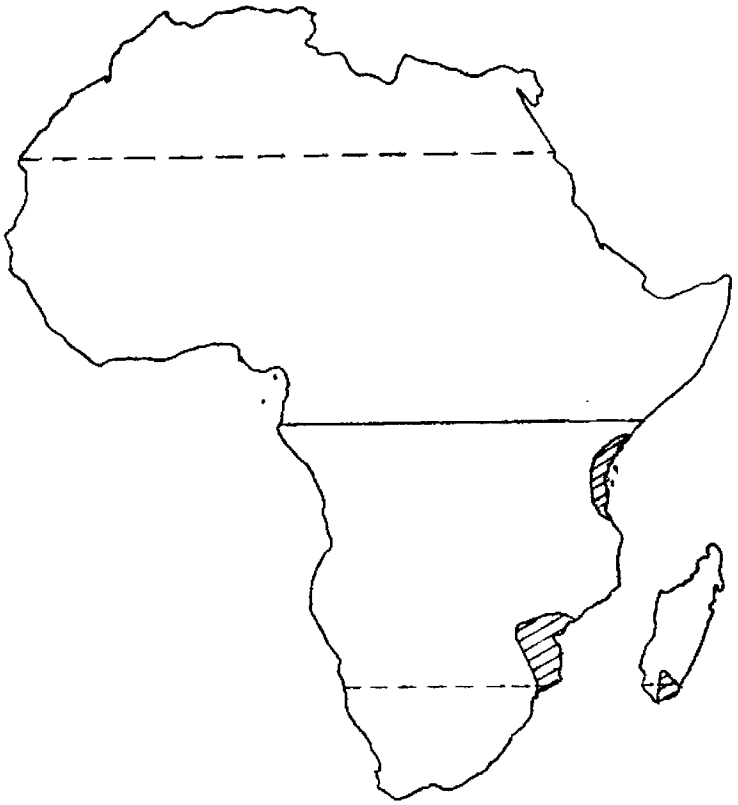


Fig. 36

The distribution of *P. alcicorne* in Africa and Madagascar.

Fig. 37

Small developing shield of the Madagascar *P. alcicorne*, showing an extremely high number of black hairs.

Platycerium andinum
(an-DE-num) Named for the Andes Mountains

Common Name- American Staghorn

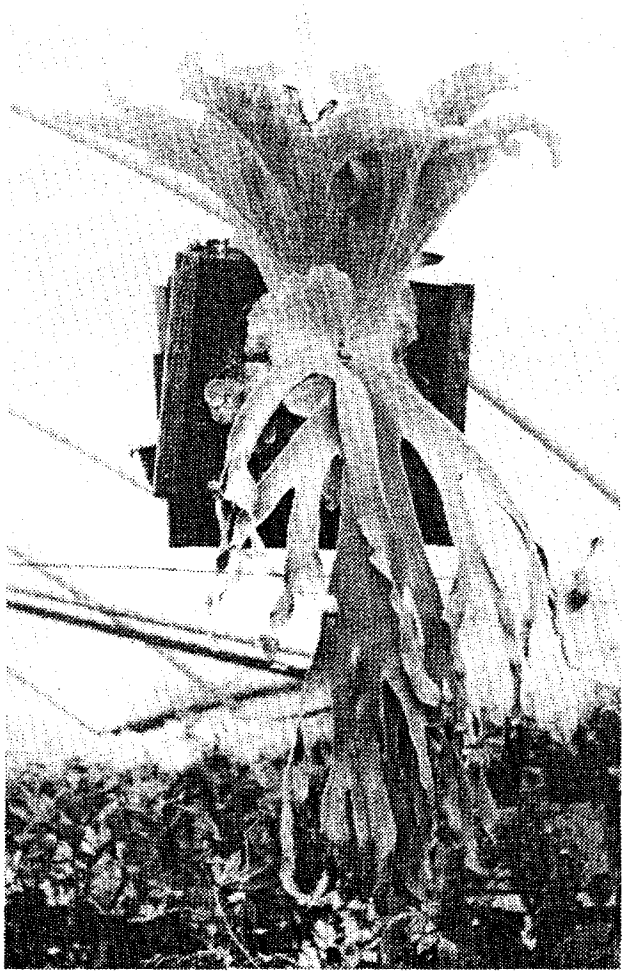


Fig. 38

Platycerium andinum, with pups.

Platycerium andinum is a decidedly tall and slender plant. In nature it is said the fertile fronds become more than 2 meters (6 feet) long, but in cultivation they tend to be shorter. The shield fronds have a rather even, medium dense coating of hairs on both sides, but the fertile fronds are coated heavily with hairs on the back side and lightly on the top. The bud is obvious, and has long, light green hairs around it.

This species forms pups, but not freely, and it is not a rapid grower. Also it tends to form shield fronds in the early summer and fertile fronds later in the season. The tips of the fertile fronds may continue to grow even after the spore patch has formed.

Among hobbyists *P. andinum* has a reputation as a strange plant to grow. The author has seen groups all purchased at the same time, when the same size, but with some growing very well and others not. One Miami nursery cultivated many from pups and considered it an easy species. Many feel it

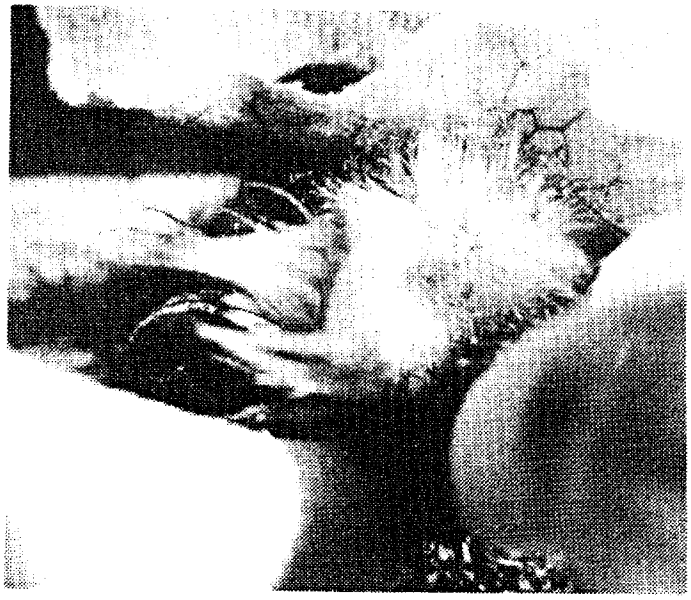


Fig. 39

P. andinum bud area, the two large objects in the bottom half of the photo are fertile fronds, above the bud is the frilled edge of a shield frond.

cannot take cool nights, however, another nursery in south Florida leaves *P. andinum* outside on cool windy nights and considers this treatment a key to successfully keeping the species. It may be *P. andinum* is more sensitive to high temperatures than most *Platycerium.*

Jerry Horne recommended that those having difficulty with *P. andinum* should allow it to dry out more between waterings, particularly if it has a thick mass of shields. The author

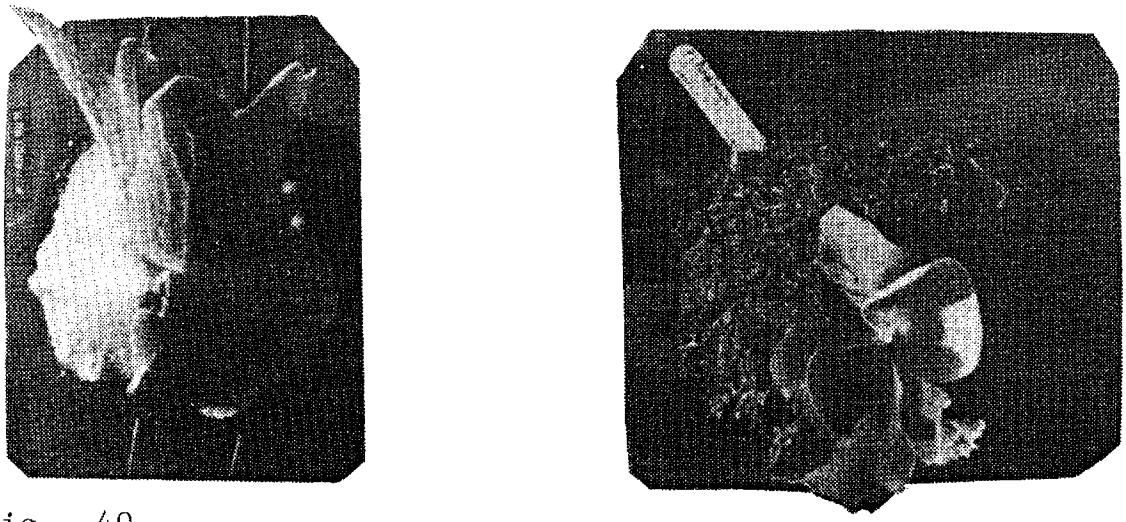


Fig. 40

Two *P. andinum,* the left tissue cultured, the right a sporeling. Photographed at the same time, they did other things at the same time. They both grew right shield fronds, then they both grew left shield fronds, then they both started fertile fronds, then they both died, of rhizome rot.

treats *P. andinum* much like *P. elephantotis* giving it bright light, a rather loose moss, evenly moist, but not wet. *P. andinum* is particularly prone to rhizome rot when small. It is easier to start with a large plant.

P. andinum is the only staghorn species found in the Americas. Not much is known about its distribution except it lives on the eastern slope of the Andes, at elevations around 300 meters (1000 feet), in Peru and Bolivia. Only a few place names are in print. It has been imported from Iquitos, Peru, but those who imported it say Iquitos is only the shipping point for the fern, and many tropical fish, but not the collecting point. Reports say it grows abundantly in isolated locations. In 1980 this author searched in Ecuador, from Limoncocha along the Rio Napo to Tena, for *Platycerium* and found none.

Its closest relatives are the African *P. elephantotis*, and the Madagascar *P. quadridichotomum*. Hennipman and Roos consider it to be closer to *P. quadridichotomum*, because the spore patch location of the two is similar.

P. andinum must be considered a somewhat difficult species.

Fig. 41 The distribution of *P. andinum*.

Platycerium bifurcatum

(bi-fur-CA-tum)

Common name: Common Staghorn

This species name comes from the word bifurcate which means to divide or fork. It describes the branching shape of the fertile fronds. *P. bifurcatum* has generally narrow fertile fronds, upright with the ends hanging down. The tips of the shields are divided into lobes which are often pointed and extend forward. The shields are usually tan to brown during the spring and summer. New green shields form during the late summer and fall. Fertile fronds remain green and form most of the year. Each fertile frond lives two to three years.

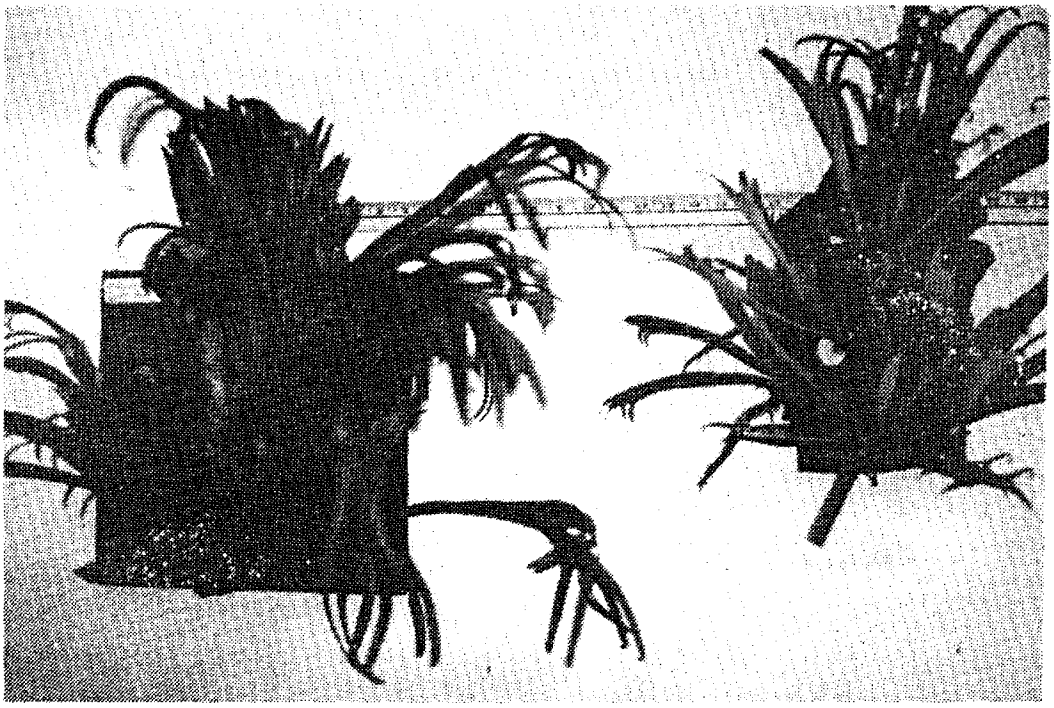


Fig. 42

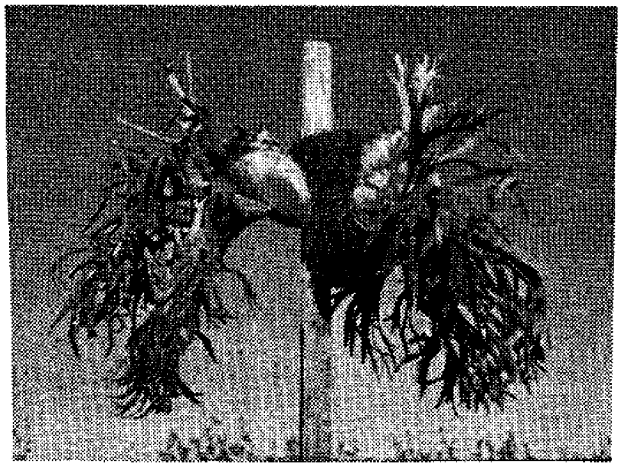
Two *P. bifurcatum*, collected in Australia about 750 km (500 miles) apart. The rule on the back is marked in inches.

Fig. 43

A natural variation of the shield fronds of a *P. bifurcatum*, from the wild. This plant was growing on a beefwood tree, at the Lamington National Park, O'Reilly's Botanical Garden, 920m. (3,000 feet) elevation, Queensland, Australia. Photo by Ralph Hughes.

Chances are the first *Platycerium* a hobbyist owns will be a cultivar of this species. In my case it was a *P. bifurcatum* cv. Netherlands, spotted in K Märt. Being a very tolerant species, starting with it nearly assures success, even if only its minimum cultural requirements are met. The most common causes of death while in the care of the beginning hobbyist are: overwatering while the hobbyist is home taking care of the plant, or drying out to the point of root damage while the hobbyist is away on vacation. Since much of its natural range is outside the tropics, this species can take a light frost, and is often grown outdoors in southern Florida and coastal southern California.

P. bifurcatum forms pups easily. Giant baskets or balls of it are sold by nurseries in localities where they can be kept outside. Eventually more plants will form than the hobbyist could possible need. The solution often is to keep only one or two large individual specimens of each desirable cultivar and limit their pup formation by removing the new buds.



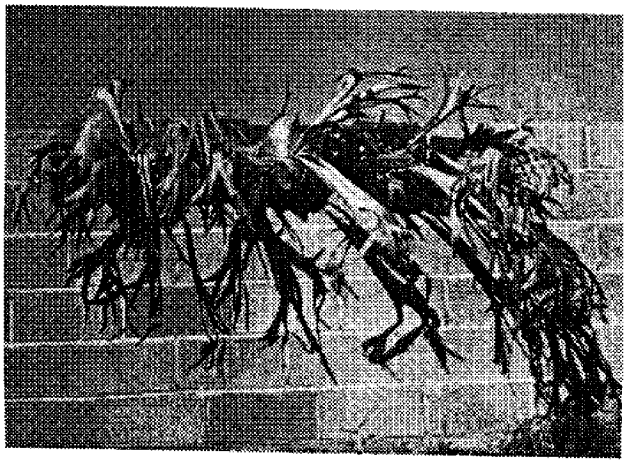


Fig. 44

Left: A basket of *P. bifurcatum* cv. Netherlands. The rhizome of one has grown forward so far the plant could break loose.

Right: The plants in the basket were separated and put on plaques. Given time, this species will form more pups than the hobbyist could possibly need.

Fig. 45

Above, recently collected *P. bifurcatum*. Right, same plant one year later.

In these single mountings, as the rhizome elongates and the shields pile up, the bud will gradually move forward to where the entire plant is in danger of coming loose and falling to the ground. To prevent this crash it will be necessary every few years to remove the plant, trim back the shield frond mass, and attach it again with the bud moved back closer to the mounting.

Importation of *P. bifurcatum* is rare since its cultivars are better adapted to conditions in cultivation. *P. bifurcatum* is an easy species, a good choice for starting a *Platycerium* collection.

This species is called *P. bifurcatum* spp. *bifurcatum* var. *bifurcatum* by Hennipman and Roos.

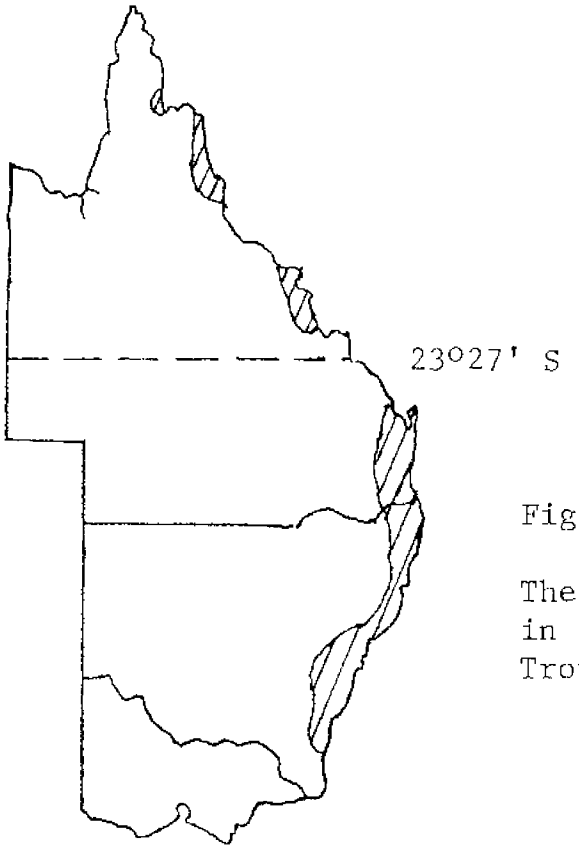


Fig. 46

The distribution of *P. bifurcatum* in Australia, mostly below the Tropic of Capricorn (broken line).

Platycerium coronarium

(cor-o-NAR-i-um)

Common name: Disk Staghorn

The species name means crown, describing the shape of the mature mass of shields. Shield fronds of *P. coronarium* are lobed along the top edge plus very thick and corky when compared to other species of staghorns. They may be rather light green and waxy.

The fertile fronds form a long and twisted mass, with spore patches on the underside of kidney-shaped lobes. These spore patches have been observed falling out in one large mass. The function of this is not known, since it would seem single spores would be more easily carried by the wind. The closest relative to *P. coronarium* is *P. ridleyi*, the only other staghorn with a special lobe for its spores.

Fig. 47

The tall lobed shield fronds of *P. coronarium* show well on this cluster on the trunk of a palm tree. The spore lobes of the fertile fronds are larger than those on cultivated plants.
Photo by Jack Wood

P. coronarium is widely distributed through Vietnam, Burma, Thailand, Sumatera, Borneo and the Philippines. Franken and Roos reported in Sumatera it is very common in the lower levels of the swamp forests, where there may be little light.

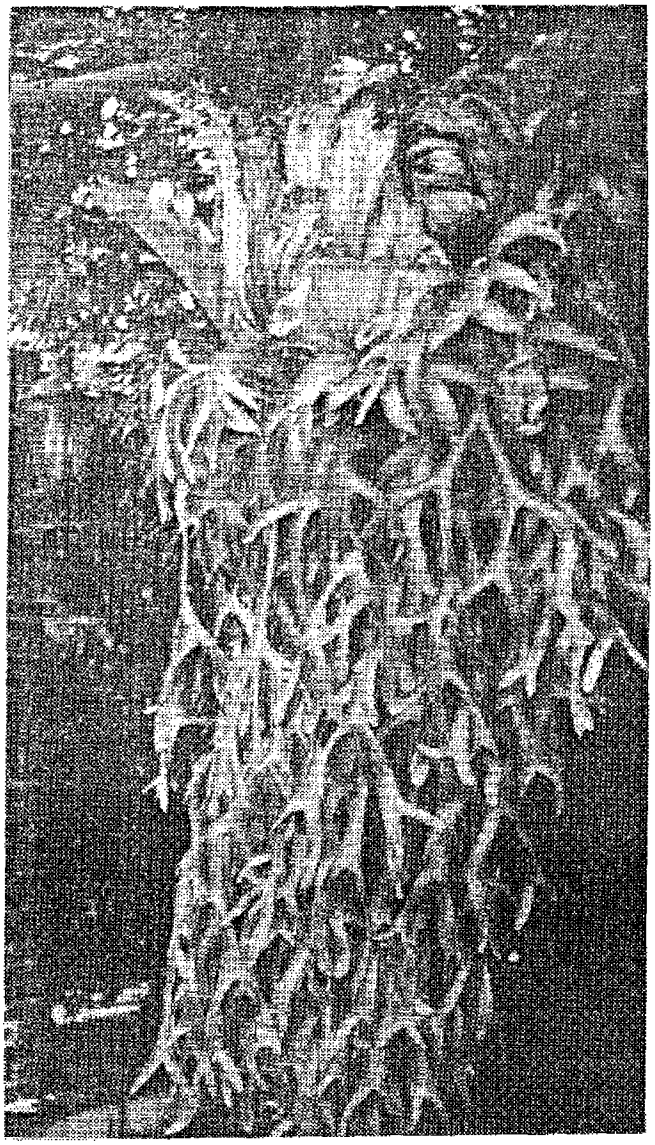
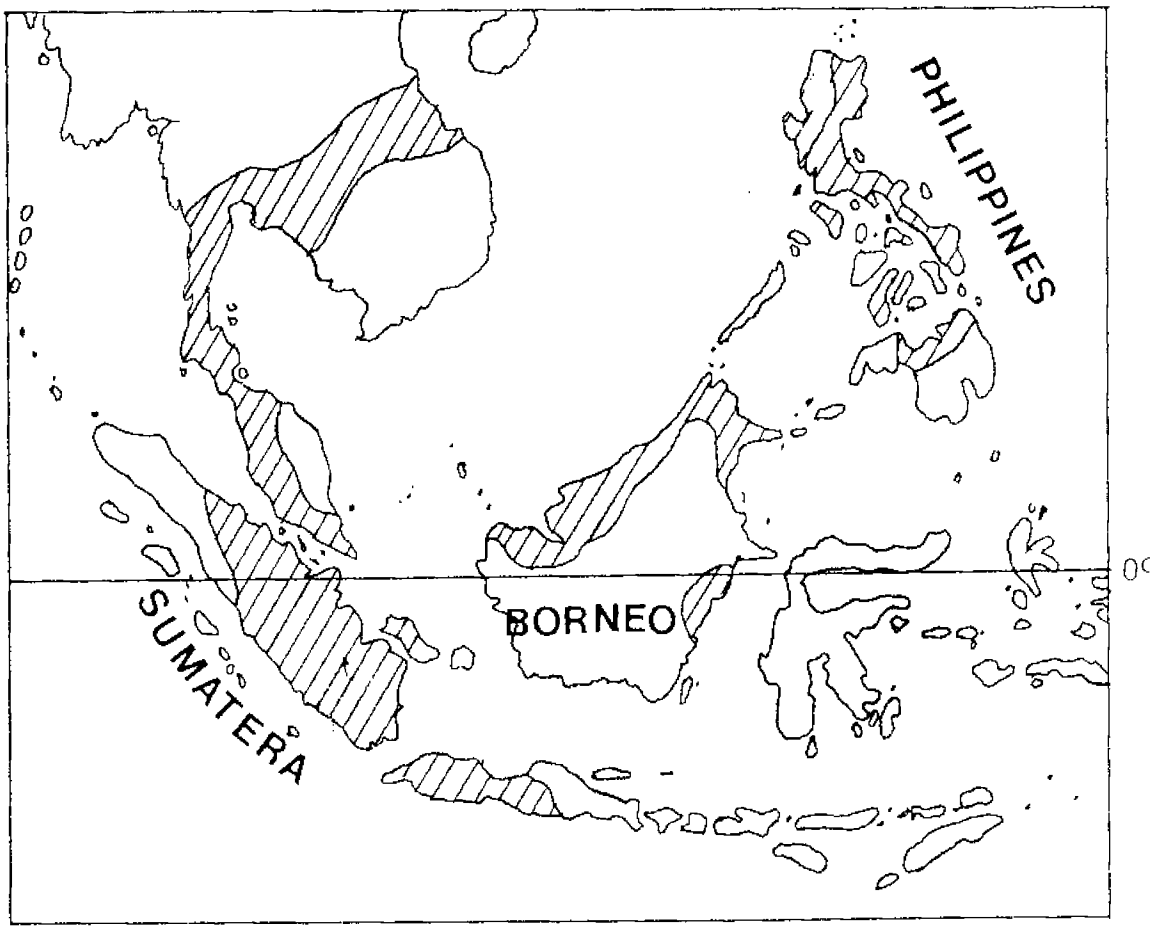


Fig. 48

A ball of *P. coronarium* hanging in a tree in Miami. The fertile fronds of the youngest plants, in the right side, are shorter.

Fig. 49

The estimated range of *P. coronarium*, Thailand Vietnam, Bangka, Borneo, Malay peninsula, Burma, Philippines, Singapore, Riau Archipelago, Java, from sea level to 500 meters (1600 feet) elevation.



This staghorn forms pups differently from any other species. The rhizome, back in the moss away from the bud, forms a branch which grows towards the side where it comes to the surface, becomes a bud and grows into a pup. This branching tends to be in the same plane as the original bud, making the buds of the pups appear in a row, all about the same distance above the ground. In nature this allows the plant to form a cluster which surrounds the tree trunk. In such clusters, the oldest plants have the longest fertile fronds.

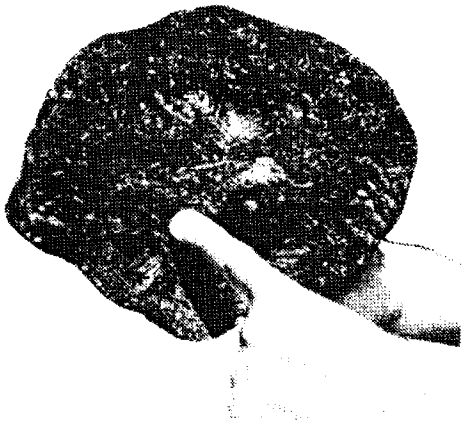


Fig. 50

Back of the shields of a newly imported *P. coronarium* with a developing rhizome branch. The top parts of the shields were trimmed from the picture.

Some people plan ahead for this type of branching by mounting *P. coronarium* either in a ball, or locating it on a board so the bud is below the bottom edge of the wood. Either way prevents the rhizome branch from running into anything solid.

P. coronarium must be considered moderately difficult to grow mainly because getting it truly established can be a problem. Many of those in the trade are imported from Thailand and may have massive shield fronds, each over 1.5 cm (1/2 inch) thick. These make it very easy to keep too much water in the plant, which invites rots and insects. Other difficulties arise because the shields and fertile fronds are cut back greatly before shipping to reduce weight. It is best to let the importer establish the plant after such treatment.

In nature *P. coronarium* is nearly always ant-inhabited, which may mean it actually attracts insects. Natural light levels tend to be low, but occasional photographs show it in nearly full sun.

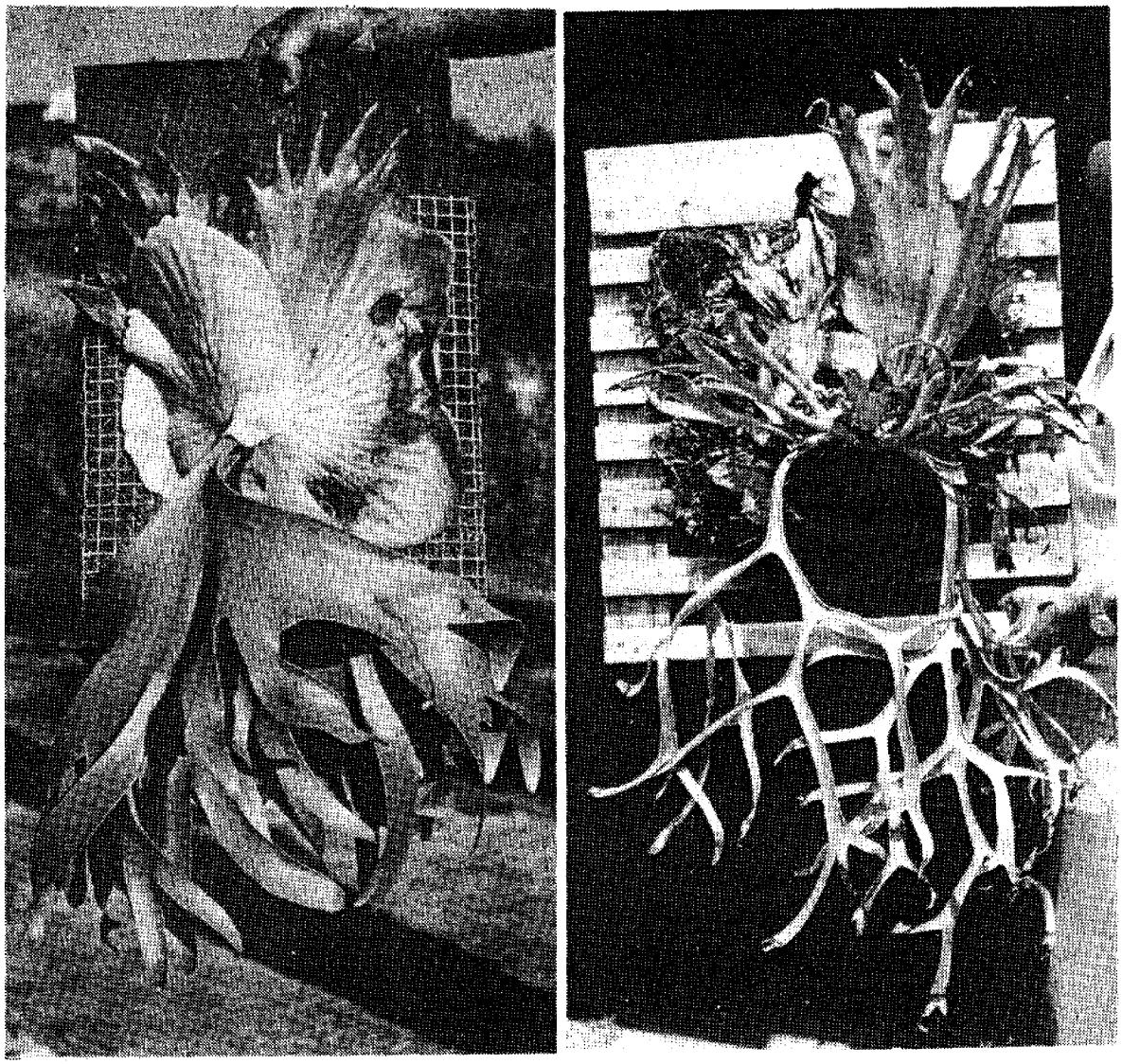


Fig. 51 A *P. coronarium* with extremely wide fertile fronds, and another with extremely narrow fertile fronds.

Once established, *P. coronarium* tends to be a tough plant that will live for a long time. Even then it can be killed by overwatering. It stands cool temperatures best when dry, and is not a cold-hardy species.

A dwarf *P. coronarium* is reported, but collectors are not in agreement about its traits. Some say it has fewer hairs, others say it has shorter fertile fronds. However, shorter fertile fronds are characteristics of young plants.

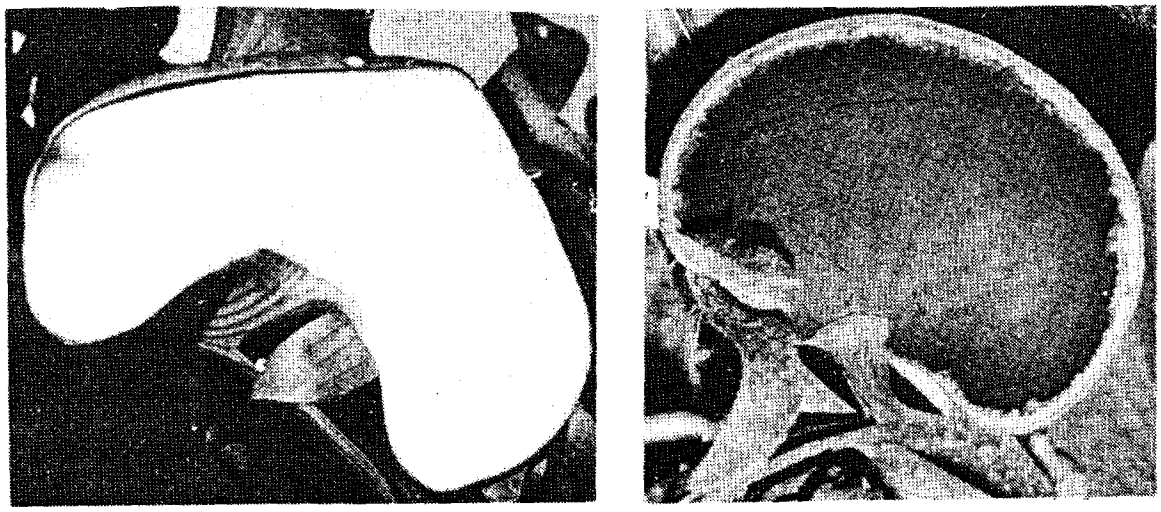


Fig. 52 At the left a white, immature spore patch of *P. coronarium*. At the right a brown, mature spore lobe, which has released its entire mass of spores.

Fig. 53

A cluster of *P. coronarium* in a grove of palm trees. New plants have formed by the rhizome branching to the side, which keeps the new plants the same distance from the ground as the older ones, forming a ring of *P. coronarium* around the tree.

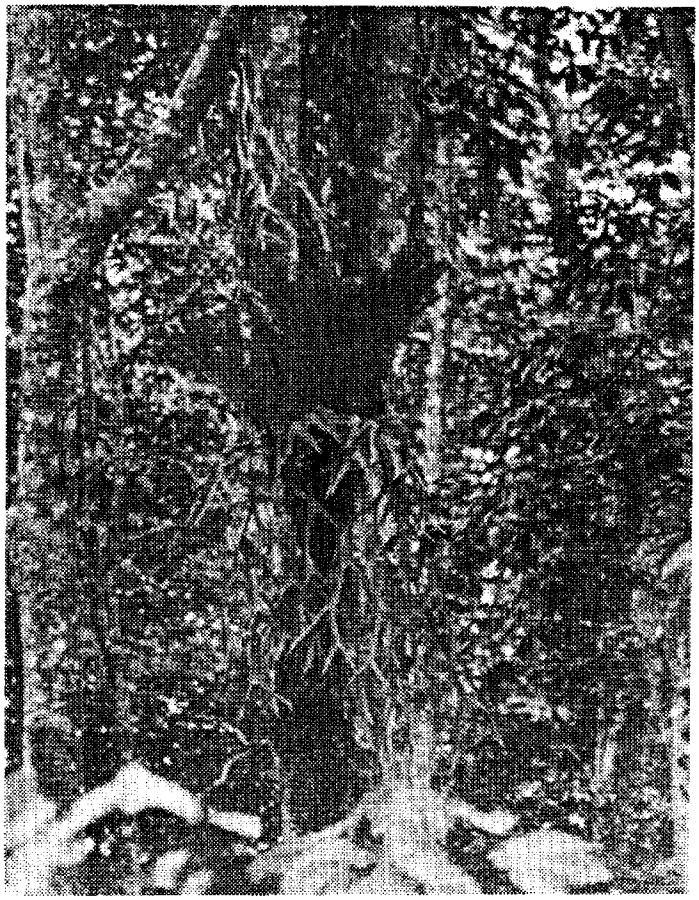


Fig. 54

P. coronarium growing on a rubber tree. These two photos, and Fig. 47, were taken by Jack Wood along the road between Malacca and Singapore, Malaysia. *P. coronarium* was the only *Platycerium* species he found there. He also noted the *P. coronarium* growing where only little debris could fall behind their shields, remained small. Such small plants could have caused reports of a "dwarf" form of this species.

Platycerium ellisii

(el-LEE-see-eye)

Platycerium ellisii is very closely related to the African form of *P. alcicorne*. They have the same yellow-green color, waxy coating, and they both tend to grow round shield fronds in the spring and early summer, and fertile fronds during the late summer and fall. In the fall their shield fronds begin turning a very dark brown near the center. (Pg. 20) The color change moves gradually to the edge. The fertile fronds of *P. ellisii* are different from the African *P. alcicorne* in consistantly being wide and divided into only two points near their tips.

The range of *P. ellisii* is restricted to Madagascar, whereas *P. alcicorne* is from both Africa and Madagascar. The person who introduced *P. ellisii* into the U.S. has collected them off mangroves at sea level along the central east coast of Madagascar. Many of the mangrove stems they grew on were only 1.5 cm. (½ inch) thick, and the shield fronds often had spaces 2.5 cm. (1 inch) wide behind them. The function of the spaces is unknown.

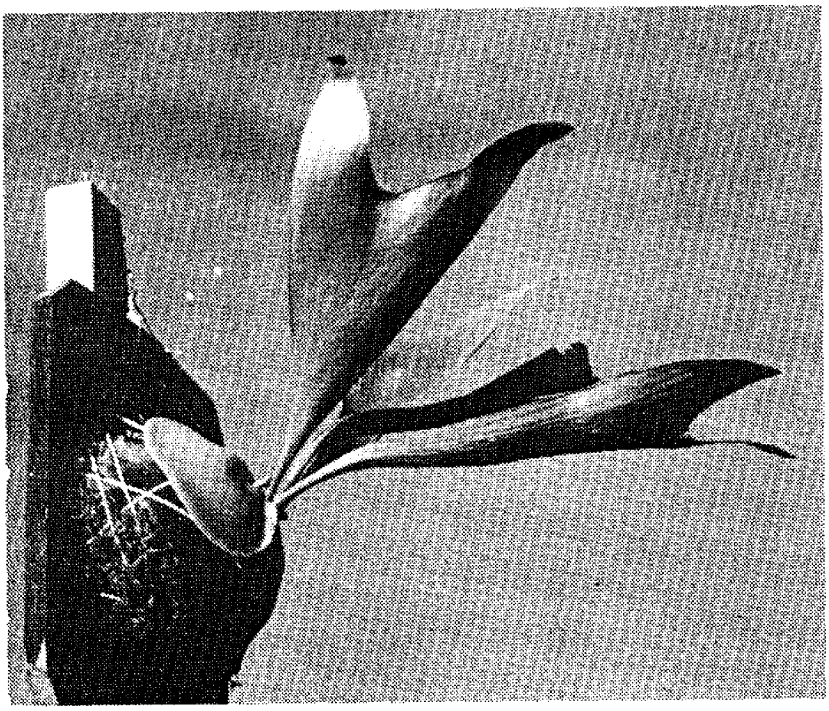


Fig. 55

Typical *P. ellisii*.

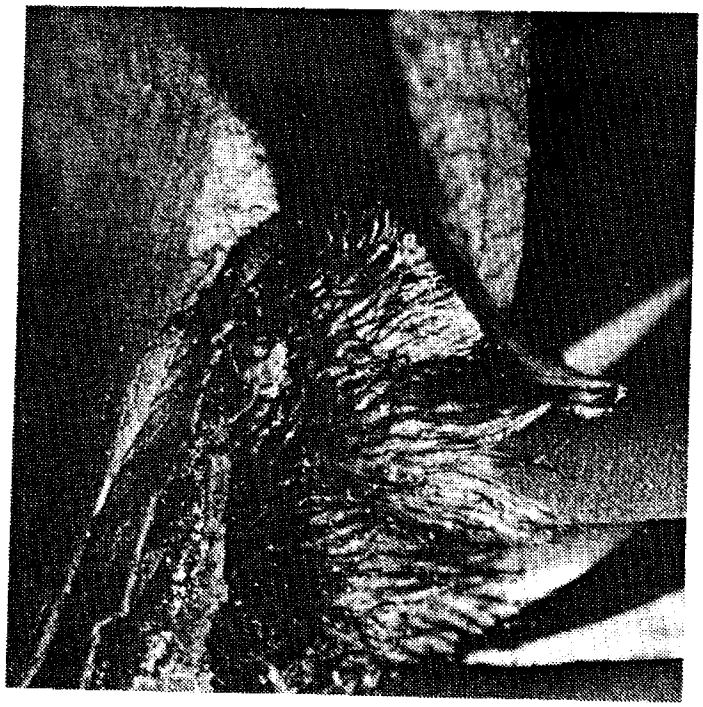


Fig. 56

Bud area of *P. ellisii* with the edges of some shields removed so the scales would show. The newest shield, coming from above, covers the bud, typical for this species.

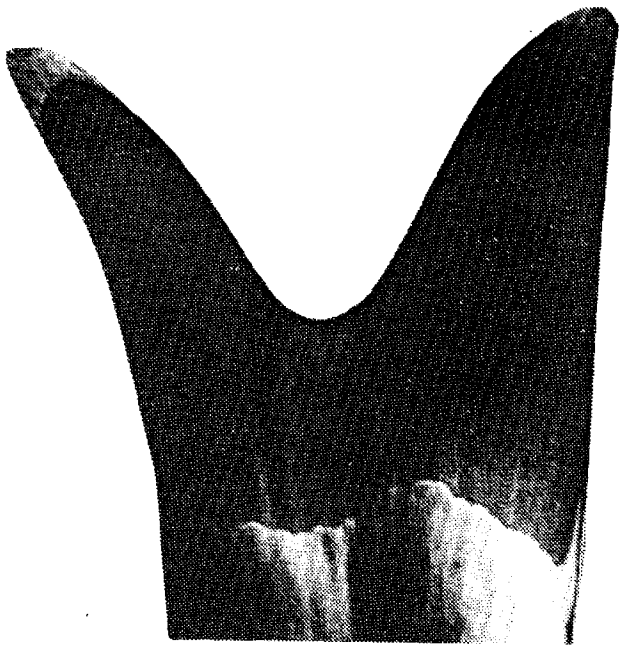


Fig. 57

Spore patch of *P. ellisii*.

The natural habitat and structure of this plant combine to make it something of a mystery. Its range must be very warm and humid. The leaves of mangroves are large and could shade *P. ellisii* greatly. The fertile fronds of *P. ellisii* are wide, and require some shading. They also have waxy coating, which should help them retain water, but the thin shields and the large air spaces between them limit the whole plant's ability to store water. This combination gives a plant which does not lose much water through its fertile fronds, but does not store water well in its shields.

This unusual plant requires some unusual care. The rhizome of *P. ellisii* grows upward quickly. Its roots are very shallow and nearly all just below the bud. When the newest shields do not fully cover the older ones, the plant has advanced to where it probably has few roots in the moss. It should be removed and trimmed so the bud is again in the center of the mounting. Moss should be packed around the rhizome and into the spaces between the shields, which means some of the shields will have to be dug away. When packed with moss, and kept in a moist, warm, and bright location, *P. ellisii* pups freely in mid-summer. Lack of pup formation is an indication a trim is needed. Trims may be necessary as often as once a year. Due to its shallow roots, the author much prefers plaques to baskets for this species.

Fig. 58

The shield frond mass of *P. ellisii*, cut to show the air spaces between them. Shields cover the top of the moss.

There are reported to be three forms of *P. ellisii*; the standard form, one that grows little divisions at the tips of the fertile fronds and has been called "diversifolium," and a wide leaf form which can have fertile fronds 20 cm (8 inches) across, and 86 cm. (34 inches) long.

Although not as simple to grow as *P. bifurcatum*, *P. ellisii* is not difficult, and makes a unique and interesting addition to a *Platycerium* collection.

Fig. 59

P. ellisii form called "diversifolium" which has extra tips on its fertile fronds.

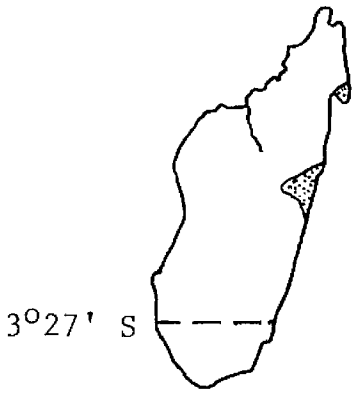


Fig. 60

Distribution of *P. ellisii* on Madagascar.

Platycerium elephantotis

(elephan-TOE-tis)

Common Name: Angola Staghorn

The most striking feature of this species is its massive bright green group of shield fronds, which grows so large *P. elephantotis* is sometimes called the lettuce staghorn. Its fertile fronds are long, very wide, hang down, and have no notches or fingers along the bottom edge. Their large size has given it another common name, the elephant's ear fern.

Growth of *P. elephantotis* is very seasonal. Each spring the shields from the year before die. The new shields can grow more erectly if the tops of the dead ones are trimmed away. During the summer it forms a new shield frond mass, and later it grows fertile fronds.

Fig. 61

A young *P. elephantotis*, about average shipping size. This plant is also pictured in Fig. 62 b, and on page 19.

Its distribution is from coast to coast in central Africa from 200 to 1500 meters (650 to 5000 feet) elevation. In Uganda it is reported from 1500 meters elevation in the mountains in large trees. In"East Africa Vegetation," Lind and Morrison describe it as growing in the forest and also common in trees in wooded grasslands, a drier environment than *P. stemaria* although their distributions are similar.

a.

c.

b.

Fig. 62

Seasonal Growth

a. In the spring the shields of *P. elephantotis* die and wilt.

b. When the tops of the old shields are removed, the new shields can grow upright.

c. By early summer a new shield has formed, and a second is developing.

Fig. 63

P. elephantotis in mid-summer, with a new set of shields, starting the formation of fertile fronds. This basket planting is about 1 meter (39 inches) tall.

Fig. 64

P. elephantotis from Uganda shows shorter shields, and fertile fronds that are long. It is somewhat less prone to rots.

Many hobbyists have difficulty with *P. elephantotis*. The species naturally occurs in very bright tropical locations, with high temperatures, and dry periods. It can wilt greatly and recover completely. If kept wet, and under low light, rot can soon destroy it. Cool temperatures can give it problems also. However, in a bright, warm place, and with protection from rots, it becomes gorgeous and pups freely. The moss need not be particularly loose.

The author finds removing pups from *P. elephantotis* is particularly difficult. It seems important to let the pups become large before removal, and to fight rot in the edges of the cut shields with terramycin.

At this time this species is sold as *P. angolense*, but there is general agreement among taxonomists the name should be *P. elephantotis*. Hennipman and Roos consider *P. wallichii* the closest relative of *P. elephantotis*. Barbara Joe Hoshizaki listed it closer to *P. stemaria*.

P. elephantotis is rarely grown from spore, and doing so is reportedly difficult. Under ideal conditions, some sporelings will volunteer.

Fig. 65

P. elephantotis bud area, with two fertile fronds.

There are said to be four forms in cultivation, each with either a different length or width of fertile frond, or a different amount or color of hair.

If the hobbyist combats rots which may start due to shipping damage, and keeps *P. elephantotis* in a warm, bright location, it becomes large and different, lives many years, and is not a difficult species of *Platycerium*.

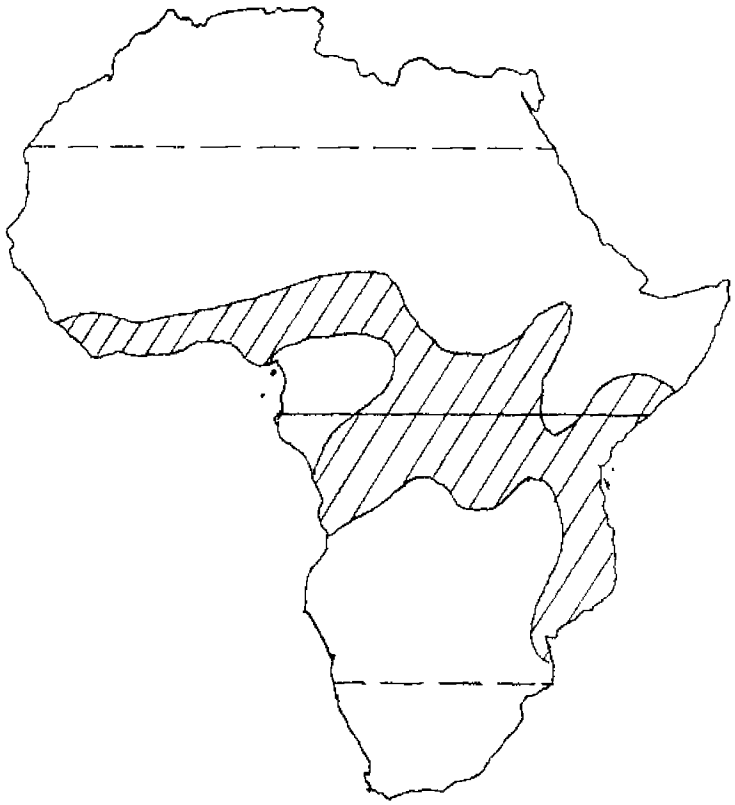


Fig. 66

P. elephantotis is found across equatorial Africa, except in the Congo basin.

Platycerium grande

(gran-dE)

In 1970 Joncheere and Hennipman separated *P. grande* from *P. superbum*. Earlier both species were included with *P. grande*. They limited the name *P. grande* to the plants on the Philippines, and gave the name *P. superbum* to the plants in Australia.

With either species the hobbyist is apt to be sold young plants. Only when these plants become large enough to form fertile fronds do they show that the fertile fronds of *P. grande* are divided into two large equal lobes, with a spore patch on each, and *P. superbum* has fertile fronds that are not divided, and have one large spore patch each. Even then the separation is confused by some *P. grande* growing their first fertile frond undivided with only one spore patch.

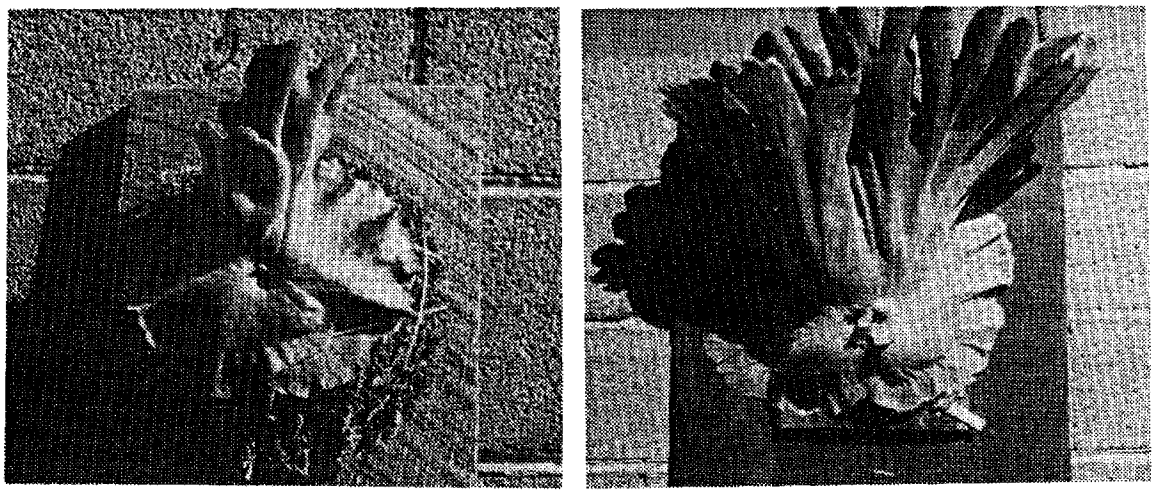


Fig. 67

P. grande grown from spore. Two photos of the same plant, taken on the same wall. The photo on the right was taken sixteen months after the photo on the left. The smaller plaque was attached to the larger one.

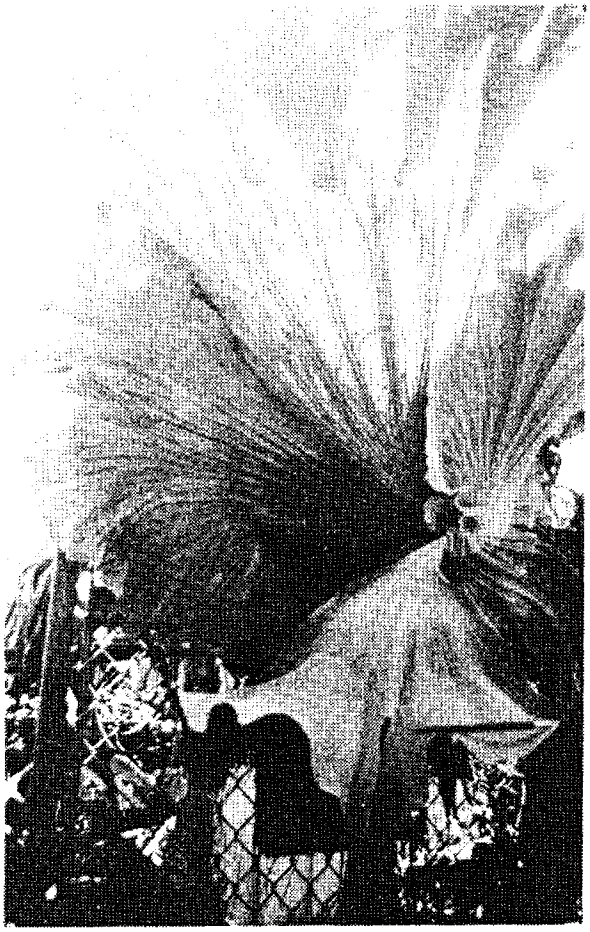
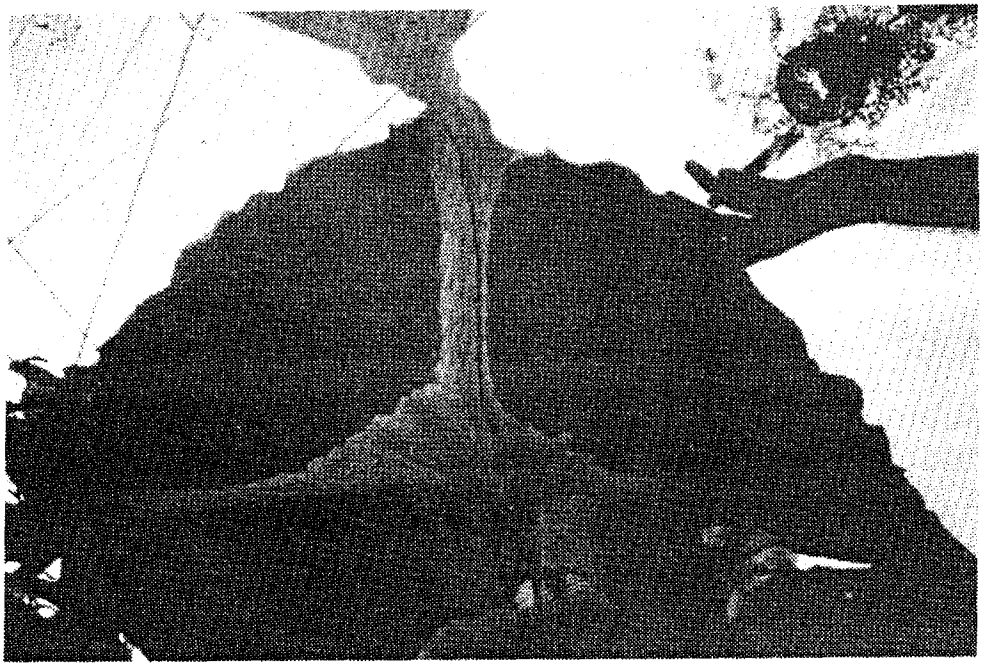


Fig. 68 (side)

A very large *P. grande*, grown from spore by its owner. The pencil on the fertile frond is to show size.

Fig. 69 (below)

Spore patches of the same *P. grande*. This is a flash photo from underneath.



P. grande is native to the Philippines, mainly the island of Mendanao, from sea level on coconut trees, to 500 meters (1600 feet) in the forest. One collector told the author it is a sad area to visit because most of the land has been cleared by the slash-and-burn method and the forest simply does not return. Clearing is to make room for man, his cities, and his crops. In this location the main crop is oil palms.

P. grande is rare in the trade, but *P. superbum* is common. Some dealers do not accept the 1970 separation of the two and sell the Australia plant as *P. grande*. The hobbyist searching for *P. grande* should look for labels like, "True *P. grande*," "Philippine *P. grande*," or lists which contain both species.

Spore culture of both is routine, so with some effort *P. grande* could become available. Now nearly all *P. grande* are collected and imported.

P. grande is grown the same as *P. superbum*, except it is less cold tolerant, but just as prone to rot with excess water as *P. superbum*. A few people feel *P. grande* does not grow as large as *P. superbum*, but given proper care they both become giants.

Fig. 70

P. grande collected on Mindanao, at sea level near Davao City. The fertile fronds are uneven, like those of *P. holttumii*. In later years it formed fertile fronds typical for *P. grande*.

Platycerium hillii

(hill-ē-eye)

Common name:
Green Staghorn

This species is closely related to *P. bifurcatum*. All types of intergrades between the two are found among the cultivars. In its purest form *P. hillii* has wide and deep green fertile fronds with few hairs. The shields are rounded along the top edge, without lobes or even undulations. They grow back flat against the plaque, not forming a nest of debris like *P. bifurcatum*.

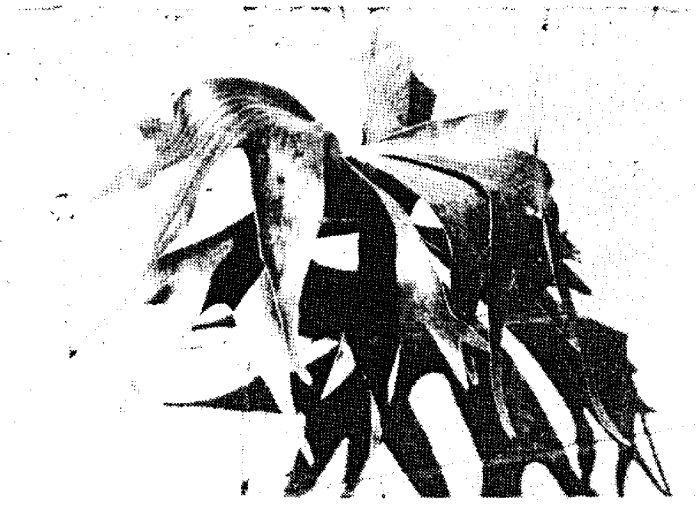


Fig. 71

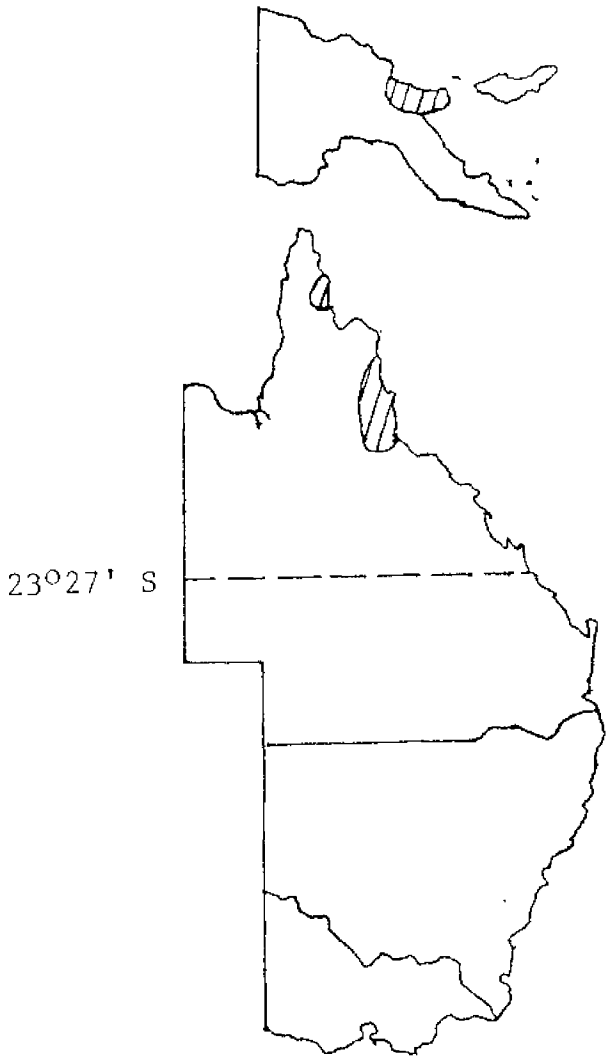
A typical *P. hillii*, grown from spore.

The growth requirements for *P. hillii* are very similar to those for *P. bifurcatum*. The natural range of *P. hillii* is quite limited, all in moist tropical lowland areas. However, it is not considered less cold hardy or less tolerant of dry periods than *P. bifurcatum*. Its wide fertile fronds sunburn easier than *P. bifurcatum*, so lower light levels are best. *P. hillii* has less the tendancy to grow outward from the mounting and fall off than *P. bifurcatum*. The tops of the shield fronds growing flat against the plaque can make watering difficult. A plastic watering tube inserted in the moss early makes later watering more effective. Otherwise, *P. hillii* can be treated the same as *P. bifurcatum*.

P. hillii is easy to grow and popular. Hennipman and Roos label it *P. bifurcatum* spp. *bifurcatum* var. *hillii*.

Fig. 72

Distribution of *P. hillii* in Australia and on Papua New Guinea. The Papua New Guinea part of its range is probably due to man introducing it there.



Platycerium holttumii

(holttum-ē-eye)

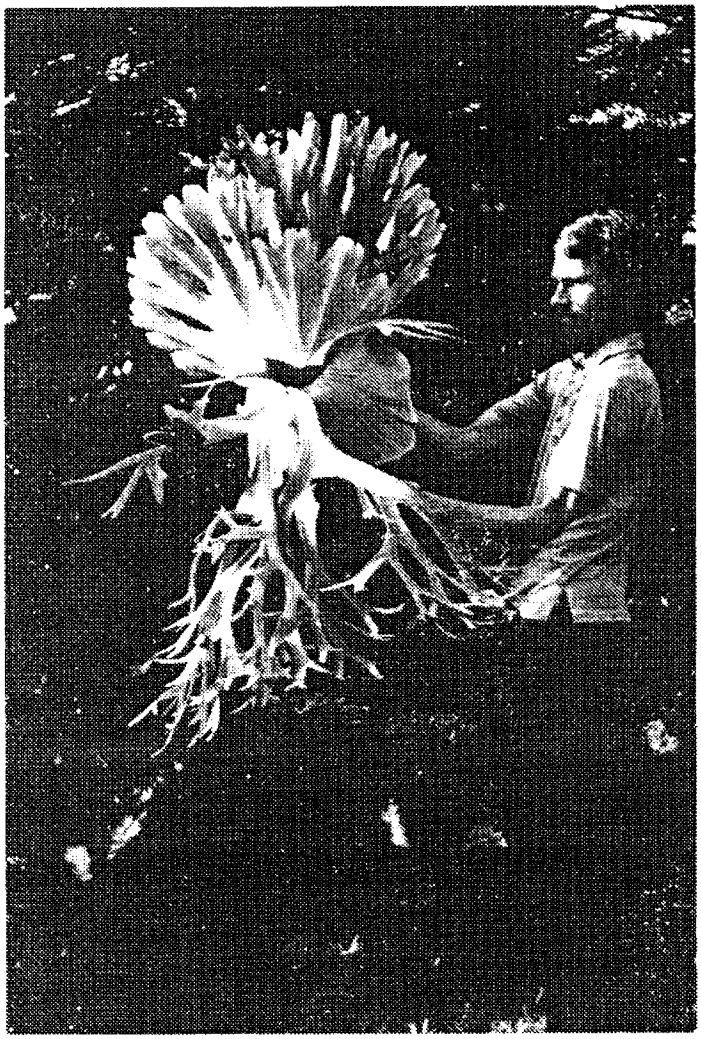


Fig. 73

Tom Henrichs holding a *P. holttumii* which shows two fertile fronds, each with a smaller lobe that is elevated, and with a larger lobe that hangs down.

In the 1970 paper which separated *P. grande* and *P. superbum*, Joncheere and Hennipman described *P. holttumii* as a new species. It is named for Dr. R. E. Holttum, of Kew, England, author of "A Revised Flora of Malaya, Vol. 2, Ferns," and many papers on ferns.

P. holttumii is closely related to *P. grande*, *P. superbum*, and *P. wandae*. It differs from the first two by having

fertile fronds with two lobes, one smaller and elevated, the other larger and hanging down. Both lobes have spore patches. It differs from *P. wandae* by not having the little points on the edges of the shield fronds around the bud.

In practice it can be very difficult to tell *P. holttumii* from *P. wandae*. Since their fertile fronds are about the same shape, the little frills on the shields at the bud of *P. wandae* (Fig. 119) become the main distinguishing feature. In a *P. wandae* with old shields, its little frills may die back, causing it to look like *P. holttumii* until new shields form.

It is also impossible to tell *P. grande*, *P. superbum*, and *P. holttumii* apart when small. The author was sent a volunteer sporeling by someone who claimed to be able to distinguish these species when small. The label read, "*P. holttumii* volunteer." A year later its identity became obvious. Pretty little frills grew around the bud, frills found only in *P. wandae*.

The author located three people who felt branching of the rhizome occasionally happens in *P. holttumii*. One showed a large buldge under the shields near the bud which was thought to be a rhizome branch growing trapped underneath. Another had a set of shields with a rhizome and bud which had fallen off a large plant, and was mounted as a separate new plant. The third wrote of a *P. holttumii* pup.

Nearly all the *P. holttumii* in this country were imported from Thailand. Its availability in the trade depends on when importations are made.

The author has lost two *P. holttumii*, one to rot which started in minor shipping damage, and the other to its bud being killed by insecticide. A friend lost a group of large sporelings to insecticide. Due to these experiences, the advice here is to be cautious with *P. holttumii* when these types of damages may occur. Certainly give it a treatment of terramycin after shipping, and avoid the bud when using strong insecticides.

In nature *P. holttumii* is from bright locations in monsoon forests. This indicates it should be given high light, and kept more moist during its growing season. *P. holttumii* cannot be expected to take the low temperatures given for *P. superbum*, otherwise they may be treated the same.

Fig. 74

"*P. holttumii* Sporeling" In the early 1970's Robert Oman, in Miami, received a group of 50 small plants from California, labeled, "*P. holttumii* sporelings." When mature their fertile fronds developed unusual shapes. Of the starting 50, Puerto Rico received 44. The offspring of one of the others are now in the trade as "Glasshouse Works." Also see page 140.

Fig. 75

P. holttumii is found in Cambodia, Laos, Vietnam, Malay Peninsula, and in Thailand, from 0 to 700m. (0 to 2,200 ft.) It is found in Thailand growing with *P. wallichii*.

Platycerium madagascariense

(madagascar-ē-en-se)

This rare species has shields like no other *Platycerium*. Their veins form tall ridges which surround little valleys. The only other species with shields anything like this is *P. ridleyi*, but in it the ridges go to the edge of the shield without forming the little valleys. The two species are not closely related.

Fig. 76

The distinctive pattern of the *P. madagascariense* shield frond.

New shields of *P. madagascariense* are thin and light green, but when mature they turn a rich, dark green which they remain until covered by another shield. The shields cover the top of the moss, and do not collect debris behind them. The little valleys cause many spaces between the shields. In nature, these spaces are inhabited by ants, and the roots of the orchid *Cymbidiella rhodochila*. Hennipman and Roos show a photo of the orchid roots in page 62.

Under fluorescent lights the rhizome may grow 5 to 7 cm (2 or 3 inches) out from the roots before fertile fronds form. In higher light the rhizome is shorter. However, the rhizomes eventually become long in all *P. madagascariense* due to the spaces between the shields. As the new shields wrap around the old ones, the whole plant becomes ball-shaped.

Ant – inhabited plants often attract other insects when in cultivation. *P. madagascariense* is not easily damaged by insecticides, so constant insect control is both feasible and essential.

Fig. 77

P. madagascariense in March, developing two fertile fronds. This species often grows two fertile fronds at once. The larger was first visible at the bud in January. In late June the spore patch was mature.

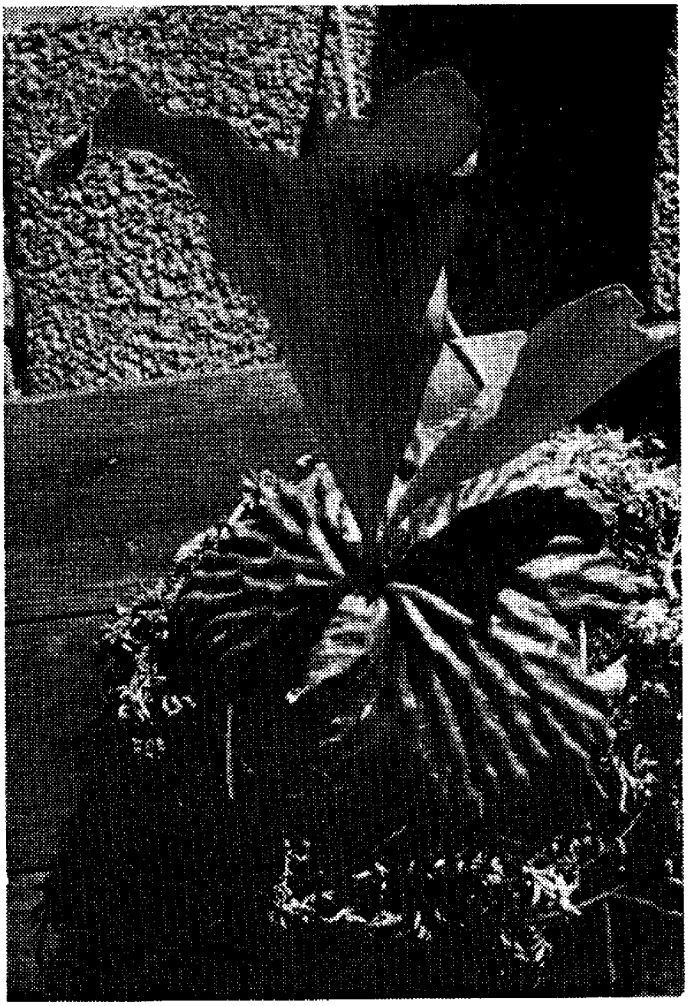
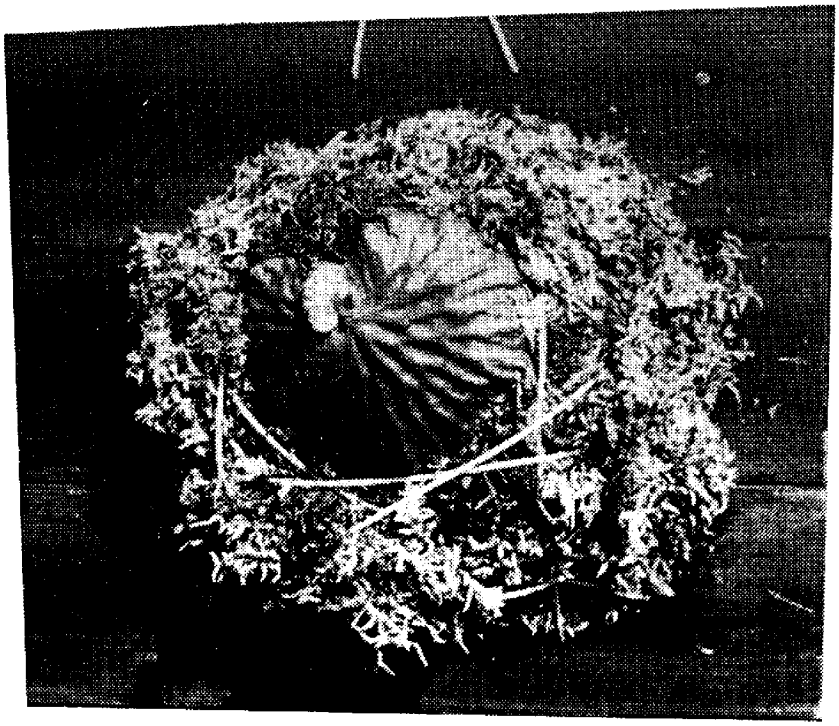


Fig. 78 (below)

The same plant, when first purchased, the November before. The plaque is 30 cm. (12 inches) wide.



High humidity, 60% or more, seems best. Some hobbyists have put this species in humidity chambers, in one case under regular fluorescent light, and had it grow and pup. Mounting in a loose moss, or osmunda fiber, helps keep the roots from being constantly wet, which reduces problems with fungi and rots. However, the shields are thin and have no water storage tissue, so the roots must be kept moist.

Temperature requirements are an area of confusion. Several people feel it has trouble taking high temperatures, the exception being Jerry Horne, who grows it very successfully in Miami, outdoors, all summer, under 60% shadescreen, on a south-facing wall. Also, during a winter when his plant house was enclosed in plastic, to test their minimum temperature, he put three *P. madagascariense* outside, with some protection from above, on a night the temperature went down to -1 degree C (30 degrees F.). There was no damage of any kind.

Removal of pups is often not successful, an indication pups should be allowed to become rather large before being cut off. Spore culture is not considered unusually difficult. Sporophytes are allowed to become 2.5 cm. (1 inch) across before they are transplanted. The other gametophytes seem to wait their turn before forming sporophytes. One culture may produce sporophytes for two years.

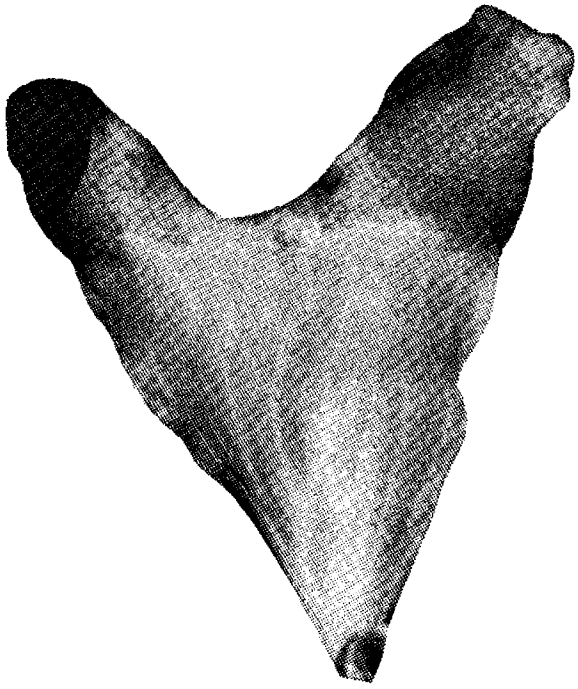


Fig. 79

P. madagascariense fertile frond with spore patch.

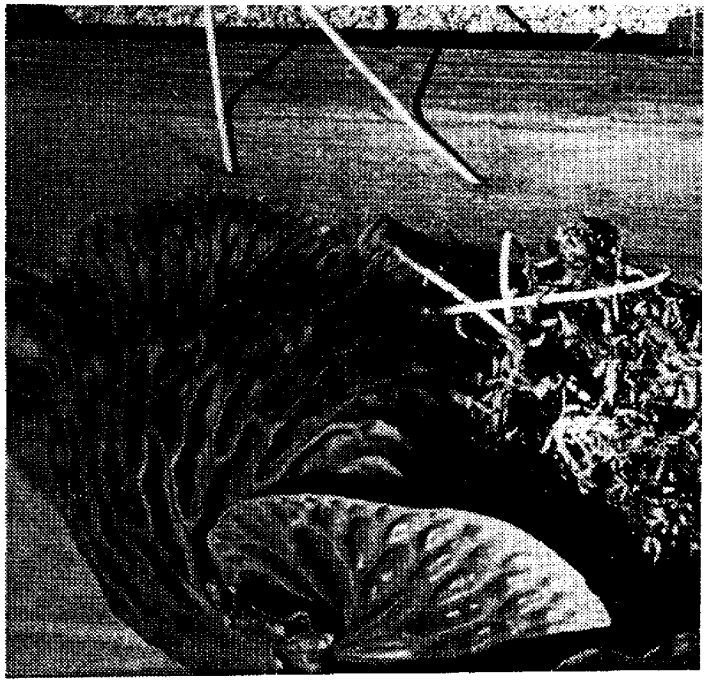


Fig. 80 (above)

P. madagascariense shield fronds cover the top of the moss and soon give the whole plant the shape of a ball.

Fig. 81 (side)

The back of the growing shield above shows the reverse pattern, since the shields are thin.

The longest the author has heard of a *P. madagascariense* being kept alive is ten years. This could be nearly its life span, but that one was lost to insect damage. Another, in a collection for some years, was consumed by snails while its owner was on vacation. One hobbyist has taken *P. madagascariense* the full cycle, gametophyte-sporophyte-spore-gametophyte, in about five years. If kept in high humidity, and free of pests, *P. madagascariense* is a beautiful *Platycerium*.

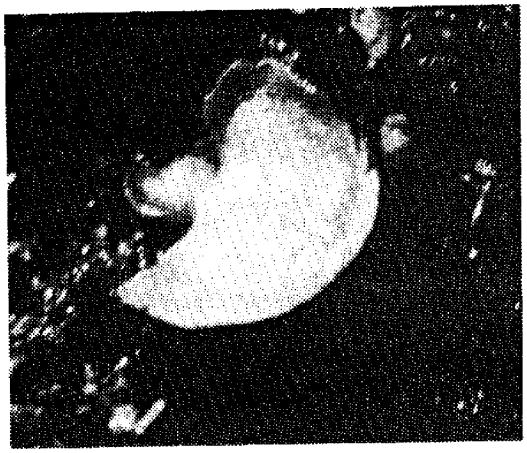


Fig. 82

New *P. madagascariense* pup, just visible in the moss. Only the bud and two tiny shields have developed.

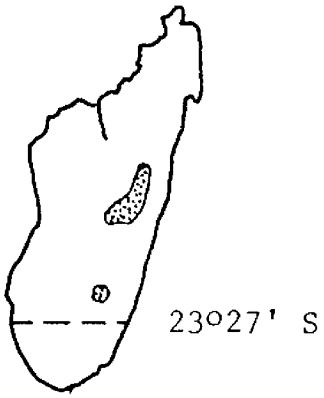


Fig. 83

The distribution of *P. madagascariense*, on Madagascar, is in the central moist forests, at elevations from 300 to 700 m. (975 to 2,075 feet).

Platycerium quadridichotomum

(quad-ra-di-cot-to-mum)

The species name describes the fertile fronds which often branch the number of times it takes to form four tips.

In *P. quadridichotomum* the fertile fronds hang down. Their edges are usually wavy. Their upper surface may be hairy in bright light. The lower surface is densly covered with tan hairs. The spore patch is dark brown, and located in the area of the second frond division, similar to *P. andinum*.

The shields are tall for such a small plant. They spread outward at the top, and show no lobes. During the summer they tend to be green. The shield number formed varies greatly from year to year.

Fig. 84

Mature *P. quadridichotomum*, about 35 cm. (13 inches) tall.

For the hobbyist this is probably the rarest and least understood species of *Platycerium*. Hennipman and Roos have increased greatly what is known about *P. quadridichotomum* in nature. Of the four species of *Platycerium* on Madagascar, it is the only one which grows on the island's drier western side. Scattered there are humid valleys where this species must be native. Even in these valleys, there are dry periods which may last six months.

P. quadridichotomum lacks thick corky shields. Its shields are more like those of *P. stemaria*. It seems to survive dry periods in a dormant state, with shield fronds dead and the fertile fronds rolled up lengthwise like tubes. This puts their protected hairy undersides towards the outside, and decreases surface area. Like this, the plants wait.

In cultivation, giving *P. quadridichotomum* these long dry periods is not done. It is not clear if it actually requires these periods, or is only able to survive them. It is not prone to insects like *P. ridleyi* and *P. madagascariense*. Warm temperatures seem best. It pups at an early age, but not in great numbers. Marcel Lecoufle wrote it does well under the same conditions as *Cattleya* orchids. Its spore culture is not unusually difficult.

P. quadridichotomum is rare, small, unique, and a little understood *Platycerium*.

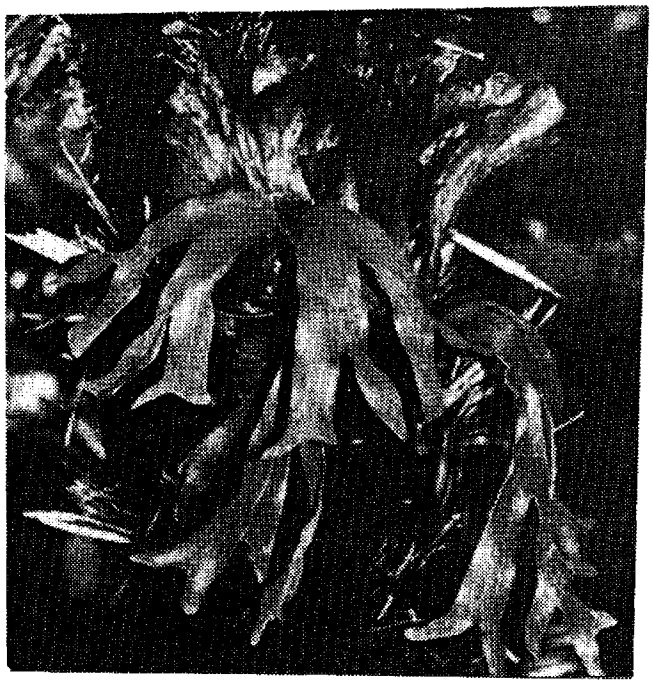


Fig. 85

A very recently imported *P. quadridichotomum*. The shields are dead, and the fertile fronds green. The pen is to show size.

Fig. 86

Spore patch of the plant picture above.

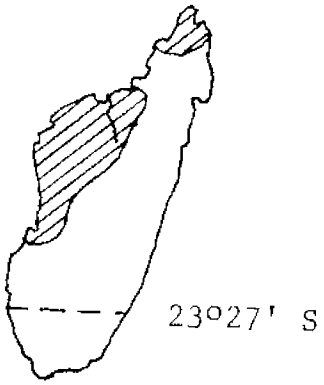


Fig. 87

The distribution of *P. quadridichotomum* on Madagascar. In the late 1960's Marcel Lecoufle wrote that collectors in the area for several weeks found none. It was called "locally common" by Hennipman and Roos in 1982. Although in forests, it more often grows on limestome rocks than on trees. No other *Platycerium* grows in this area. *P. quadridichotomum* was first described in 1959.

Platycerium ridleyi

(rid-lee-eye)

Named for J. Ridley author of "Ferns of The Malay Peninsula."

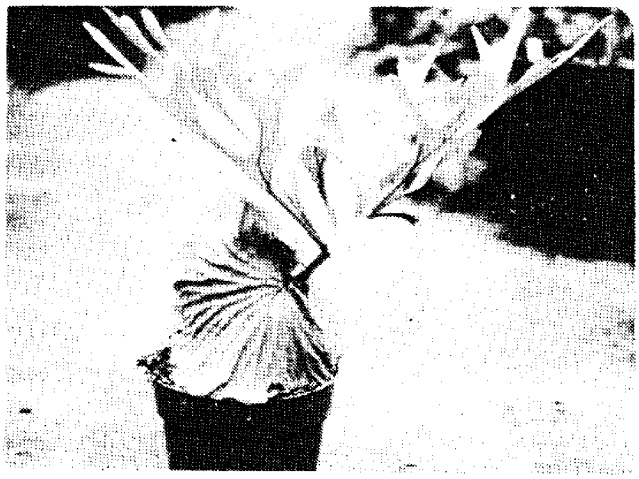


Fig. 88

The antler-like fertile fronds and distinctive shields show on this young *P. ridleyi* grown in a plastic pot in a California nursery.

The fertile fronds of this species, particularly when young, bear such a great resemblance to the antlers of a deer that "staghorn" fits it perfectly. Rarely a meter (39 inches) across the fertile fronds, it is the smallest *Platycerium* that reproduces only by spores.

The tall ridges formed by the veins on its shield fronds run in continuous lines out to its edge. These ridges cause spaces between the shields. In nature ants pack these spaces with debris, leaving only the top 1/3 empty. The spaces between the shields cause the rhizome to be particularly long.

The spore patch forms on the underside of spoon-shaped lobes. The only other staghorn to do this is its closest relative, *P. coronarium*. Like *P. coronarium*, the spores of *P. ridleyi* tend to be released in one mass.

Franken and Roos in Sumatera observed *P. ridleyi* on trees along rivers and streams, and also common on the emergent swamp forest trees, on branches more than 25 meters (80 feet) above the ground. Collection from such heights is difficult. However, due to man's clearing of the land, it has become extinct in Singapore. At this time it is almost never imported. Most of the plants now in the trade are grown from spore in southern California

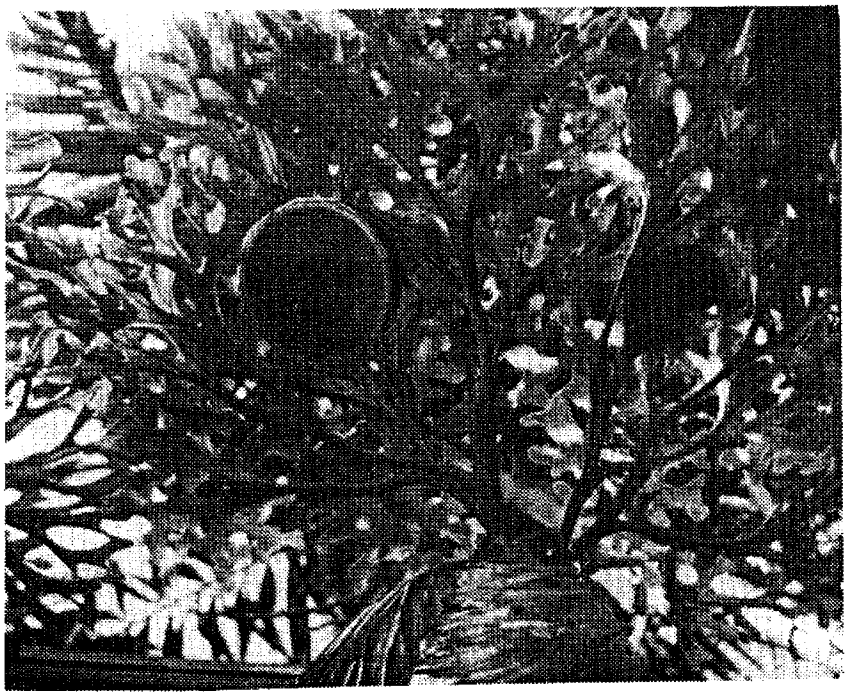


Fig. 89

Two large spore lobes on a mature *P. ridleyi* in Miami. The shields are tan and shiny. The plaque is made of many small boards with gaps between them.

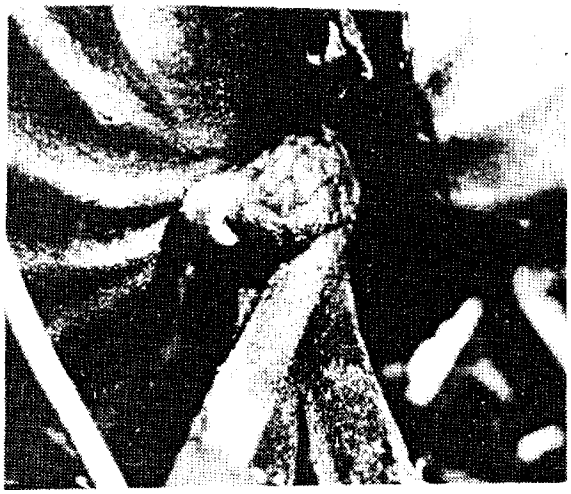


Fig. 90

The bud area of a young *P. ridleyi* with a tiny shield frond starting.

Both the narrow fertile fronds and natural habitat of *P. ridleyi* suggest it should have bright light. The air movement it receives high in the trees must be nearly the best in the forest. Some hobbyists feel air movement is an important key to keeping it successfully. Most agree on loose, rather open moss. *P. ridleyi* should not be expected to tolerate cool temperatures. Insects, slugs, and snails are definitely problems on this ant-inhabited species. There is general agreement that *P. ridleyi* attracts insects. Rhizome rot as well has claimed many young plants.

Spore collection shows no specific difficulty, other than catching the spore patch as it is released. Sporeling growth rate information varies from those who consider it the very fastest *Platycerium*, to those with plants barely 3 cm. (1 ¼ inches) tall, that are five years old. The differences are probably due to variations in levels of both light and fertilizer, the small five year old ones receiving the most light and least fertilizer. The sporelings have a tendency to form elongated rhizomes and few roots, so vitamin B_1 treatments may be very important to them. Losses are heavy when the young sporophytes are transplanted, and among quickly grown, soft plants.

With a *Platycerium* that remains fairly small, and produces no pups, there is a question of the plant's natural lifespan. For *P. ridleyi* this could be between 10 and 15 years. If this is true, the hobbyist should not expect to keep one longer.

As *P. ridleyi* gets older, the spaces between the shields cause the rhizome to become long. The danger of it breaking increases. It is not known if *P. ridleyi* can survive cutting back like is done with *P. superbum*. (Pg. 98, Fig. 102)

The author has lost more young *P. ridleyi* than any other *Platycerium*. They tend to have particularly long rhizomes which often break during shipping. This is fatal. Their young fertile fronds are tender and generally arrive damaged, so a whole new set must form for the plant to survive. Or, the old fertile fronds may die back faster than new ones are formed, so the whole plant is gradually lost.

In many southern California collections *P. ridleyi* is kept on its back, in treefern or plastic pots. In other areas it is plaqued like other *Platycerium*. Kept free of insects and rots, the author has seen many *P. ridleyi* establish and become beautiful specimens.

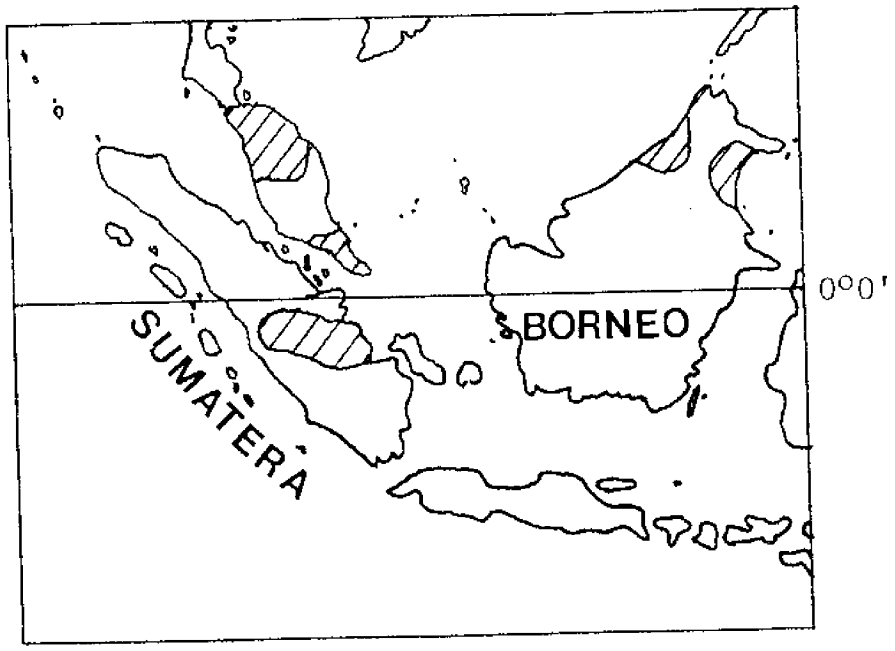


Fig. 91

The range of *P. ridleyi* includes Sumatera, Malay Peninsula, and parts of Borneo.

Platycerium stemaria

Common Name:
Triangle Staghorn

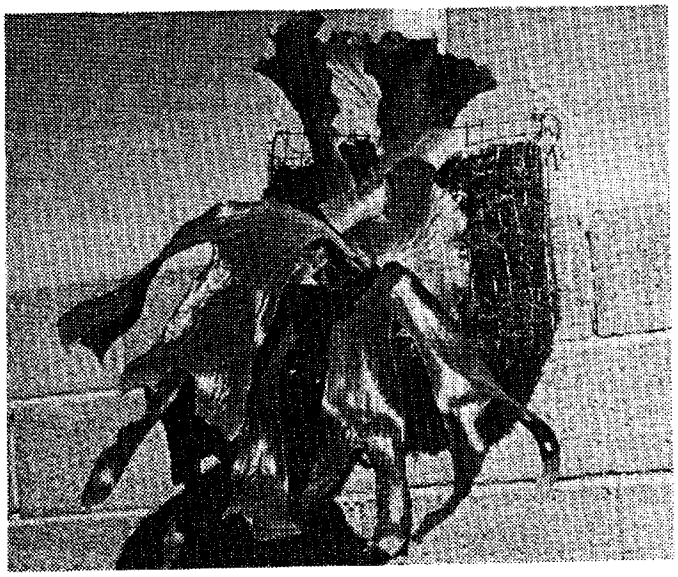


Fig. 92

A single *P. stemaria* on a basket. When young this plant grew fertile fronds with single ultimate tips. Three years later some tips had eight points.

This is the third African species of *Platycerium*. Its shields are tall, wide, and wavy at the top. They tend to be thin, and have spaces between them, where debris collects.

The wide fertile fronds are often shiny on the upper surface, and quite hairy on the underneath. Even on the same plant the fertile fronds show great variety in length, and how many ultimate tips they have, but all show a main division into two lobes and each of these lobes divides once again. There are two spore patches on each fertile frond, one on each main lobe, in the area of its division. When mature the spore patches are dark brown.

Although in some locations *P. stemaria* and *P. elephantotis* occur together, *P. stemaria* generally is from more moist places than *P. elephantotis*. *P. stemaria* is nearly always found on trees, and may form clusters high above the ground, in some sun, but more often in shade.

Some hobbyists have difficulty with *P. stemaria*. When given low light and kept quite moist, it forms lush, dark green fertile fronds and tall shields. This is how the author treats it. Under these conditions, the spore patch remains tan and does not mature. When given higher light the fertile fronds form more hair on their upper surface, and the spore patches mature to their typical dark brown.

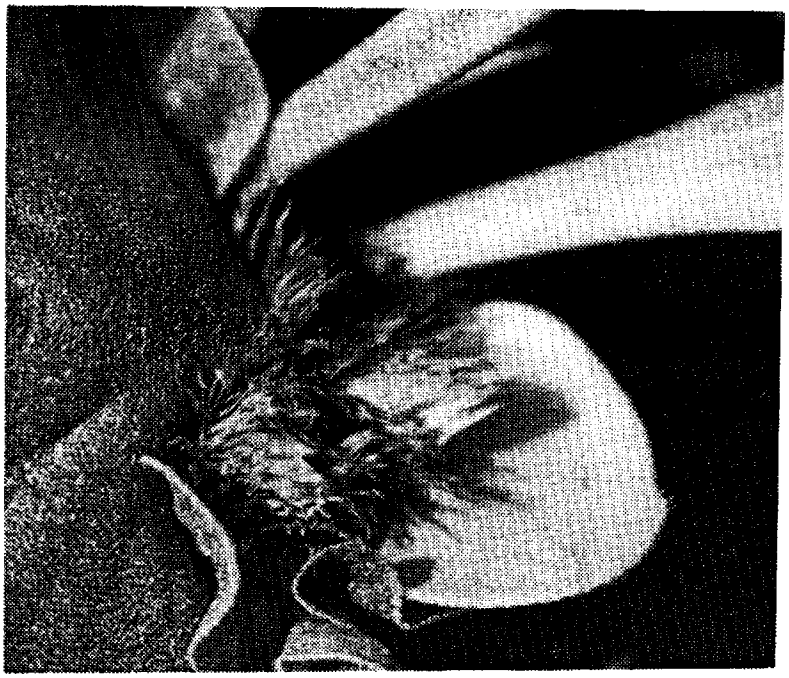


Fig. 93

Bud area of *P. stemaria* with a shield starting. Shields are typically pure white when tiny.

Fig. 94

A cluster of *P. stemaria*. The very dark spore patches show on the ends of the frond at the far right.

P. stemaria forms pups fairly easily in the most moist parts of the moss. It is almost never grown from spore. If accidentally allowed to dry, it wilts tremendously, but usually recovers fully. The tips and edges of its fertile fronds are burned more easily by insecticides than any other *Platycerium*, making extra pups of *P. stemaria* useful for testing sprays.

Fertile fronds form at any time of the year, but shields are seasonal. In late-summer shields are green. In the fall they change to brown.

In most *Platycerium* species the shields gradually die and turn brown, but *P. stemaria* is unique to watch because the shields die very quickly.

Some people feel this species should never have temperatures below 10° C. (50° F.).

Fig. 95

An imported *P. stemaria* with very long fertile fronds, and a spore patch.

The wide tops of the shields, and large fertile fronds make this species easily damaged by wind. When kept outdoors, a protected location is best.

P. stemaria is a pretty *Platycerium*, ideal for low light locations. If kept moist, it fills a basket or covers a plaque.

Fig. 96

P. stemaria shields die so quickly it may seem they have rot. The dark is brown, next to it is yellow, and at the left corners of the picture the shield is still green.

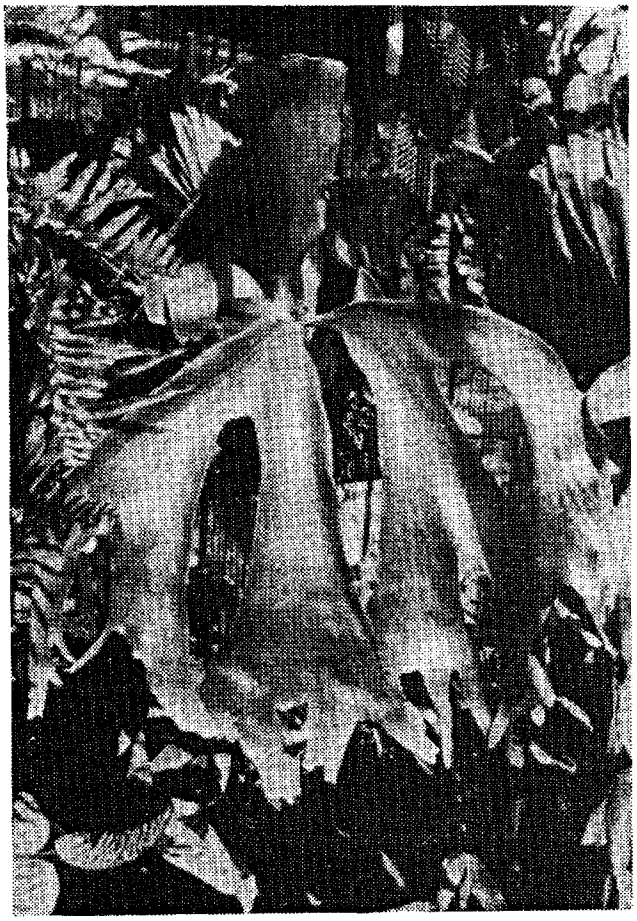


Fig. 97

P. stemaria cv. Hawks, probably from the Hawks Nursery in southern California. In 1964 Barbara Joe showed a drawing of *P. stemaria* var. *laurentii*. It is not in collections in this country.

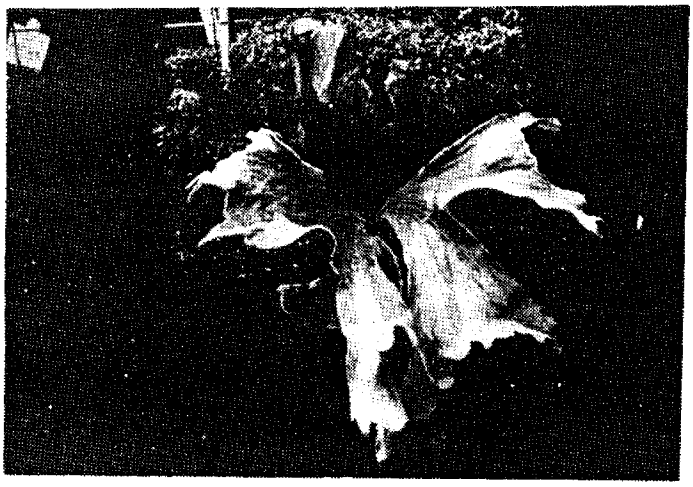


Fig. 98

An unusual *P. stemaria* found in some collections in the San Diego California area.

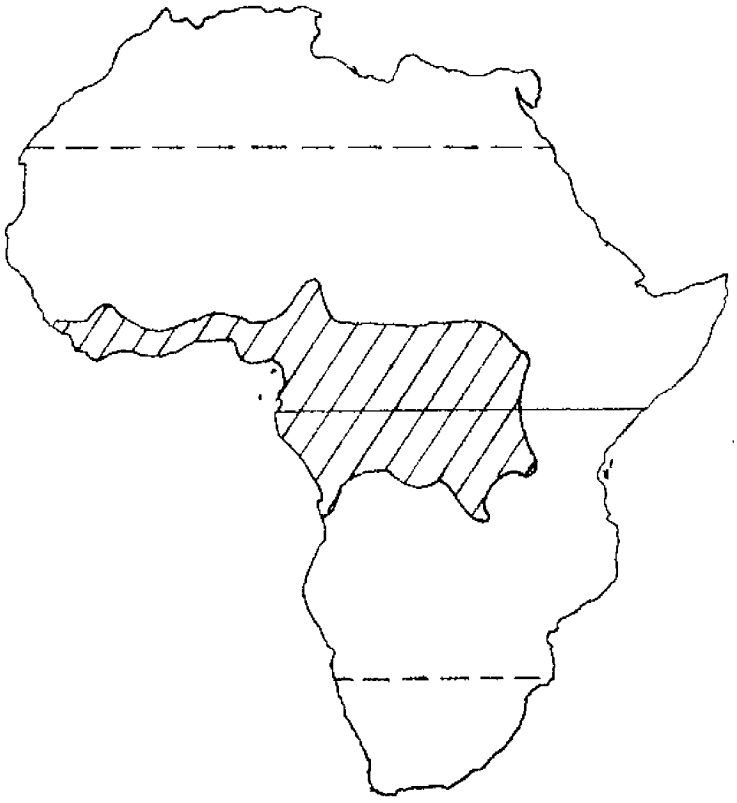


Fig. 99

P. stemaria grows in central and western tropical Africa, and islands off the west coast, at elevations from 0 to 1,000 meters (0 to 3,250 feet).

Platycerium superbum

Common Name:
Giant Staghorn

Here is the grand solitary *Platycerium* of Queensland Australia. Its shields are deeply lobed and may reach 1.3 meters (4 feet) tall. Their upper edges extend forward. Behind them is a basket-like space which collects debris and water. Before a shield dies it is covered by a new green one. Old shields curl back into the basket.

Young plants form shields only, one growing toward the right, the next toward the left, two to four per year. The new shields grow beautifully as they appear to roll back against the older ones. Their last growth is in the very tips of the upper lobes. In young plants, each shield should be some larger than the one behind it.

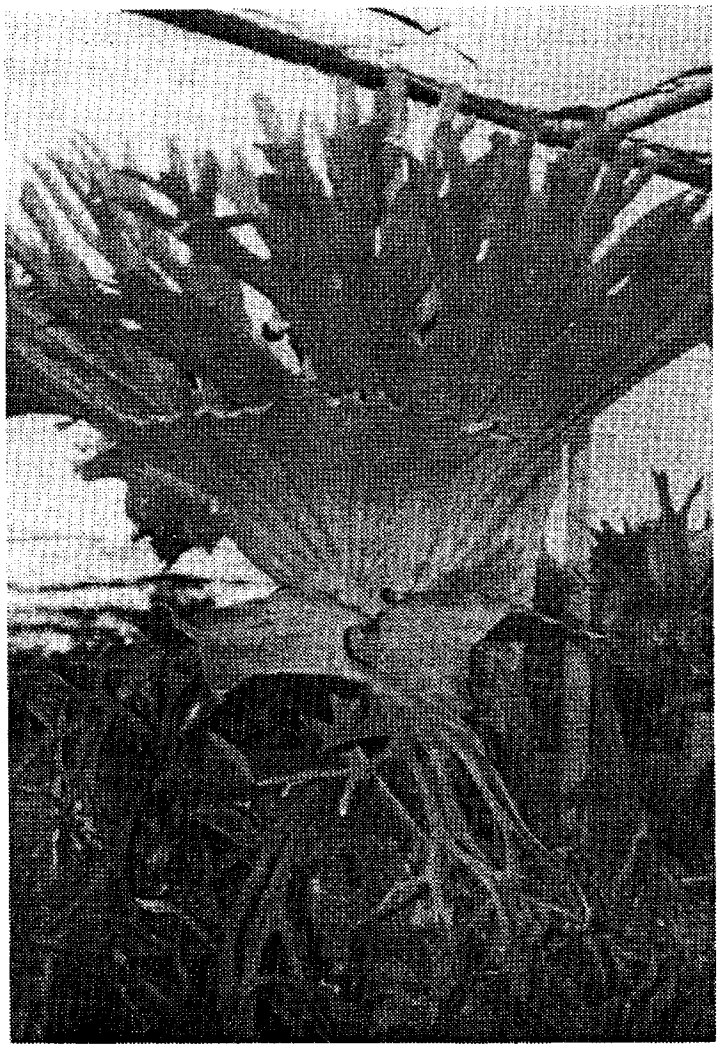


Fig. 100

A collected *P. superbum*, under about 50% shade, in a botanical garden, in Brisbane, Australia. Photo by Ralph Hughes.

When the shields are about 0.7 meters (2 feet) tall, the first fertile frond can be expected. This is a special event for the beginning hobbyist, a true sign of accomplishment. Each fertile frond has one spore patch, oval to nearly triangular, and brown when mature. The fertile frond extends down and outward from the bud. At its far corners are fingers which vary greatly in length, hanging down unless they are short.

The bud has light green hairs around it, and tends to become covered by frills from the edges of the shield fronds.

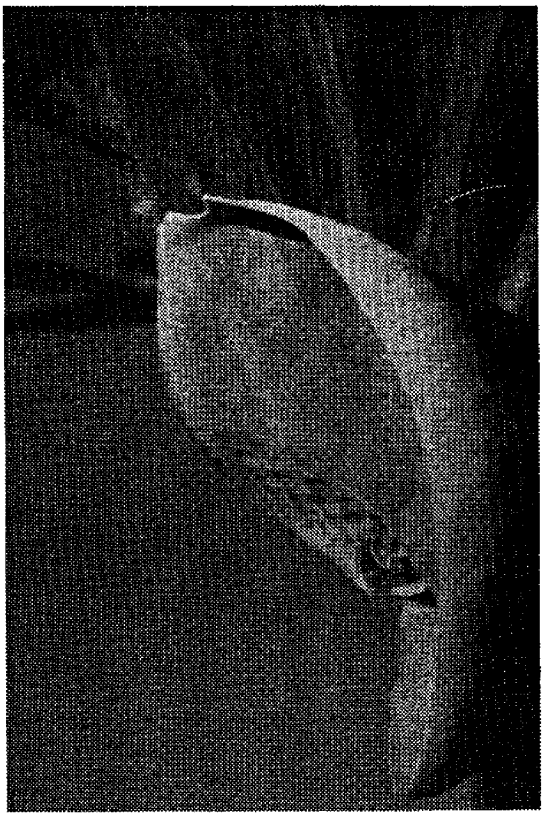


Fig. 101

New shield frond rolling back against the older ones on *P. superbum*.

The main requirement for growing *P. superbum* is space. Young plants do well on plaques, but as they become large, some basic decisions about their mounting must be made. Many beautiful log and basket mountings have been devised. The author prefers to stay with plaques, and attach the smaller ones to the larger ones, without remounting the plant. Many hobbyists do well with moss boxes that have heavy chickenwire across the front.

P. superbum probably requires less water for its size than any other *Platycerium*. It is truly sensitive to overwatering. Excess water slows growth, and encourages rots in the shields and rhizome. Keeping it on a plaque with only a small amount of moss makes overwatering more difficult.

P. superbum does well in a variety of light levels. The only difficulty with full sun seems to be the flat upper surface of the fertile frond may sunburn. If dry it can take temperatures slightly below freezing, for short periods.

In Australia it is common practice to put unwanted vegetable scraps in the basket of *P. superbum*. Banana peels are particularly beneficial.

As *P. superbum* ages its rhizome becomes longer, and the bud moves farther from the mounting. It may gradually become less vigorous and die. A sign this is happening is when the new shields do not cover the older ones. The treatment for this is to cut off the back part of the plant, and remount the front part. One *P. superbum* "Weitz" has been grown since 1942, and cut back at least four times. The other giant solitary *Platycerium* species require this treatment also, but it is not certain if *P. ridleyi* would survive it.

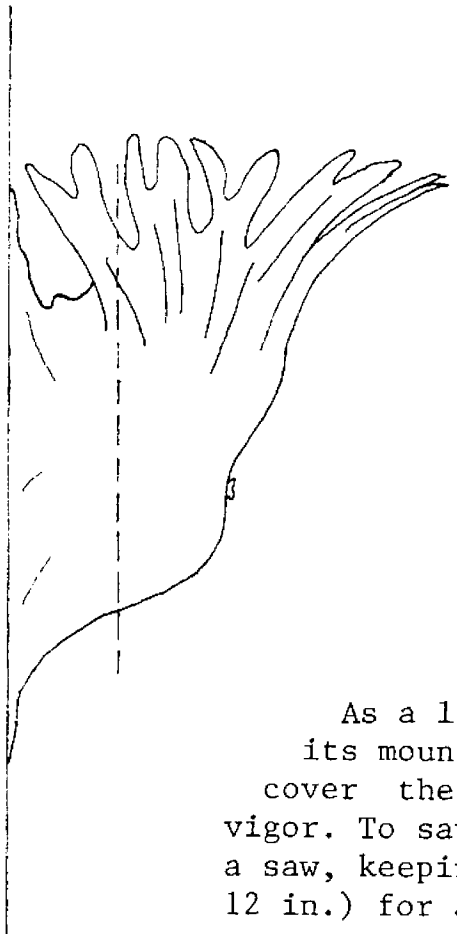


Fig. 102

As a large *P. superbum* grows away from its mounting, the new shields do not fully cover the older ones, and the plant loses vigor. To save the plant's life, it is cut with a saw, keeping the front 25 to 30 cm. (10 to 12 in.) for a new mounting.

Fig. 103

A small *P superbum*, just moved from a flower pot onto a plaque.

Spores are abundant and their culture is typical, so this species is often the first sporelings a hobbyist raises. Seven to eight years is normal from spore to a specimen with fertile fronds. Many sporelings are exported from the Netherlands, and a great amount of tissue culturing is done in California, making *P. superbum* the most readily available staghorn that does not form pups.

Two forms are found in the trade in California, "Tamburiense" and "Weitz." "Tamburiense" is supposed to be named for the Tamburine Mountains, in Australia, but it is a misnomer, because there are no such mountains. Ralph Hughes found the name that of a community with a resort hotel. Its elevation is 500 meters (1600 feet). He made observations there for three days and found the native *P. superbum* showed no unique traits. The "Tamburiense" being sold now are individuals with the least hair, chosen from groups of standard *P. superbum.*

"Weitz" is named for Mrs. Herman Weitz, a native California Indian lady, who, with her husband, had a little fern nursery in Ventura, California, before World War II. It is nearly certain she got the original plant from Mr. Rosco S. Baldwin, who had a fern nursery of some note in Pasadena, California. Formerly called the "White Grande," its most distinctive features were, it was somewhat more hairy than standard *P. superbum,* and tended to have wide sweeping tops to its

Fig. 104

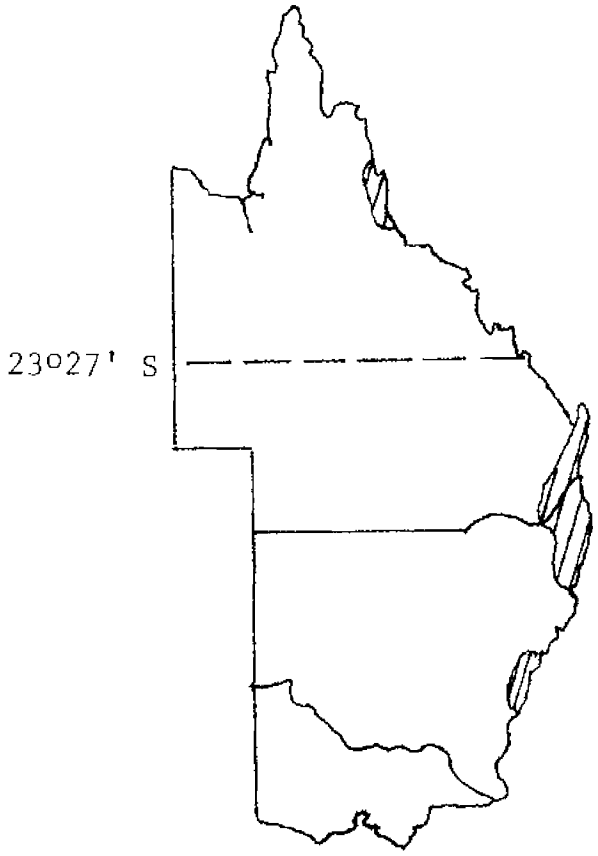
P. superbum with two buds. One bud was cut off so the plant could grow normally. While small this plant formed two other plants by rhizome branching.

shield fronds, as shows on page 66 of Wendy Franks' book, "Platycerium Fern Facts." The "Weitz" being sold now are the individuals with the most hair, chosen from groups of standard *P. superbum*.

This is a highly recommended species, which may live for many years.

Fig. 105

The range of *P. superbum* is entirely in eastern Australia, mostly out of the tropics, at elevations from 0 to 750 meters (0 to 2,500 feet).



Platycerium veitchii

(veitch-e-eye)

Probably is named for the Veitch nursery, Exeter, England, founded by James Veitch in the late 18th century and run by the family until it closed in 1914. The family was very active in early tropical plant collecting, orchids in particular.

P. veitchii is closely related to *P. bifurcatum*, but is unique in several ways. It is covered with a great amount of white hair. The tops of its shield fronds grow into thin fingers. Its fertile fronds are very upright.

Some of these traits are adaptations to the dry conditions where it is native.

Very high light levels are required for this species to show these traits fully. In less light its fertile fronds grow less erect, have fewer hairs, and fingers along the tops of the shields are shorter. The amount of water may also affect formation of the fingers on the shields. High light, with little moisture gives the most distinctive specimens.

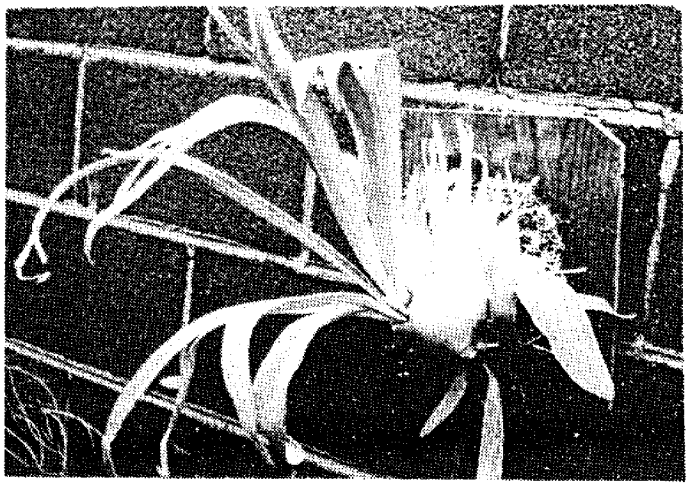


Fig. 106

Pup of an imported *P. veitchii*, white with hairs, and showing the tall fingers on the shields.

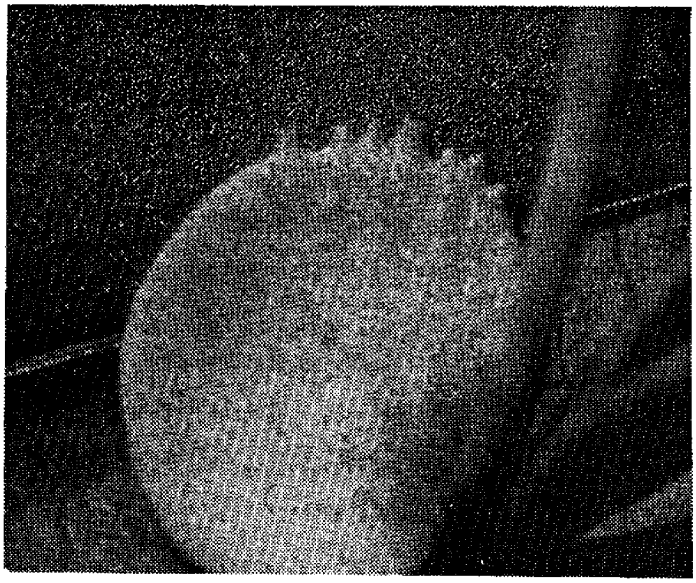


Fig. 107

The fingers already show on this tiny developing shield of *P. veitchii*.

Fig. 108
P. veitchii on sandstone of a shady seep (or spring) in Carnarvon Gorge National Park, 710 km. (475 mi.) northwest of Brisbane, Australia.

Fig. 109

In the same area as above, this single *P. veitchii* was covered with dust. There had been no rain for 2 months. The nearest weather station showed an average annual rainfall of 64.5 cm. (25.4 in.). The surrounding area was semi-arid bush country.
Both photos taken by Ralph Hughes, 5-16-1980

The early importations of *P. veitchii* were actually forms of *P. bifurcatum*. Even now they are sometimes offered in the trade as "green veitchii." True *P. veitchii* is almost identical to the old cultivar Lemoinei.

Overwatering can give *P. veitchii* difficulties, but it is an easy, interesting, distinctive and rugged species which forms pups freely. Hennipman and Roos call it *P. bifurcatum* spp. *veitchii*.

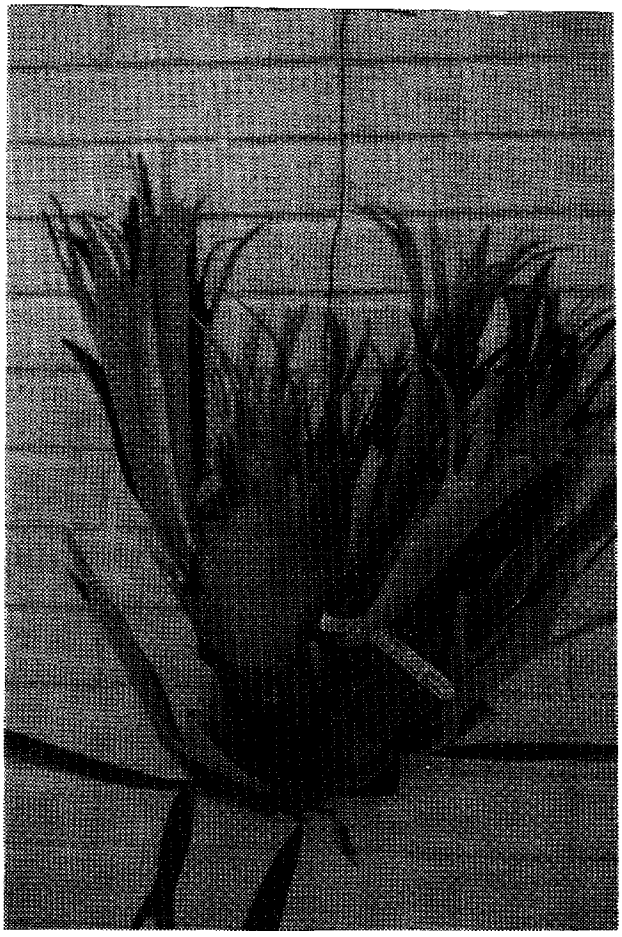
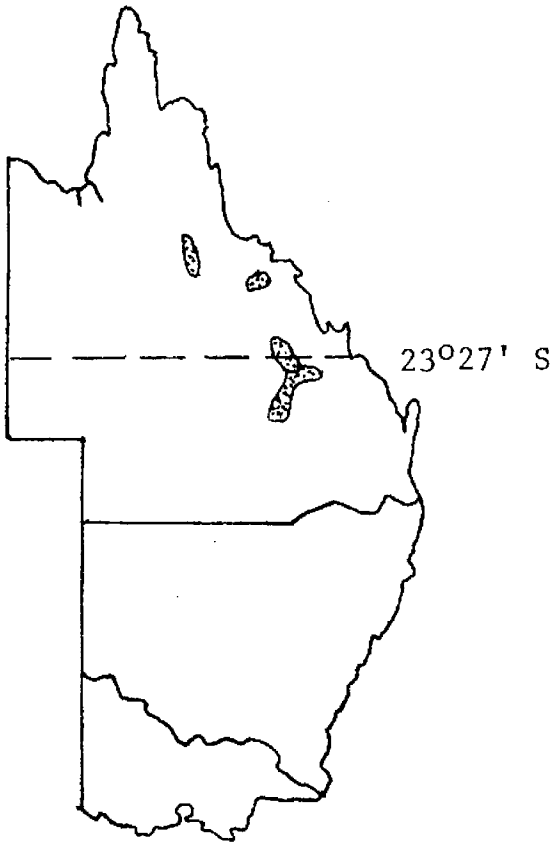


Fig. 110

Kept in full sun in south Florida, this imported *P. veitchii* shows all the traits of the species.

Fig. 111

The limited distribution of *P. veitchii*. Found growing on rocks, near springs, in semi-arid basins in eastern Australia, it withstands droughts of several months.



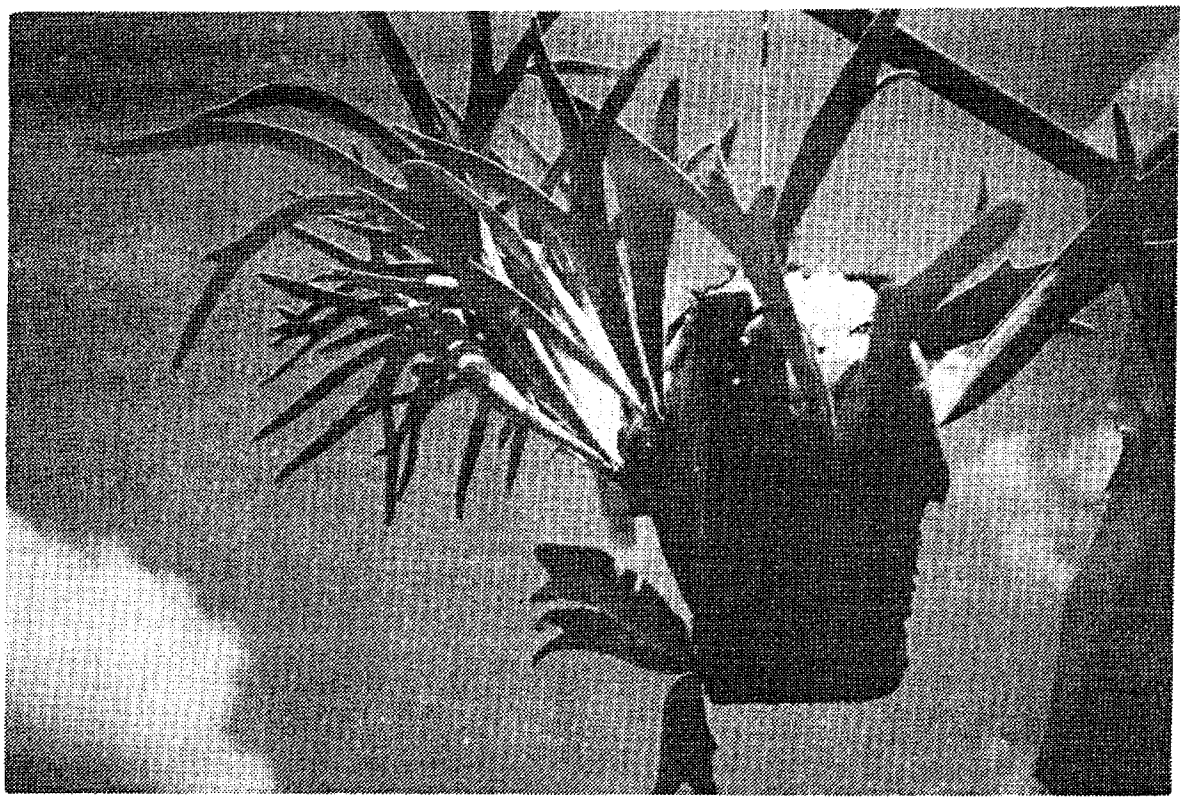


Fig. 112

P. veitchii cv. Lemoinei, forming pups through the sides of a treefern pot.

Platycerium wallichii

(wal-lee-key-eye)

Common name: Indian Staghorn

This species is named for Nathaniel Wallich, Director of the Calcutta Botanic Garden for 30 years, starting in 1815.

This species has tall spreading shields with many rounded lobes along their upper edge. It forms a definite basket. The shields may all be brown while the fertile fronds are still green.

The fertile fronds have distinctively prominent veins on the upper side. Their shape varies greatly in cultivation. Although there is one main lobe which hangs down and has the main spore patch on it, there may be a lobe to its side with another spore patch, and other lobes to the side of that which have none. If there are enough lobes, the frond becomes fan-like and the outer lobes may even blend in with the shields. The area with the spore patch extends forward and may have points on the edge.

In nature *P. wallichii* may be about 1.3m. (4.5 ft.) tall, but in cultivation it tends to be smaller.

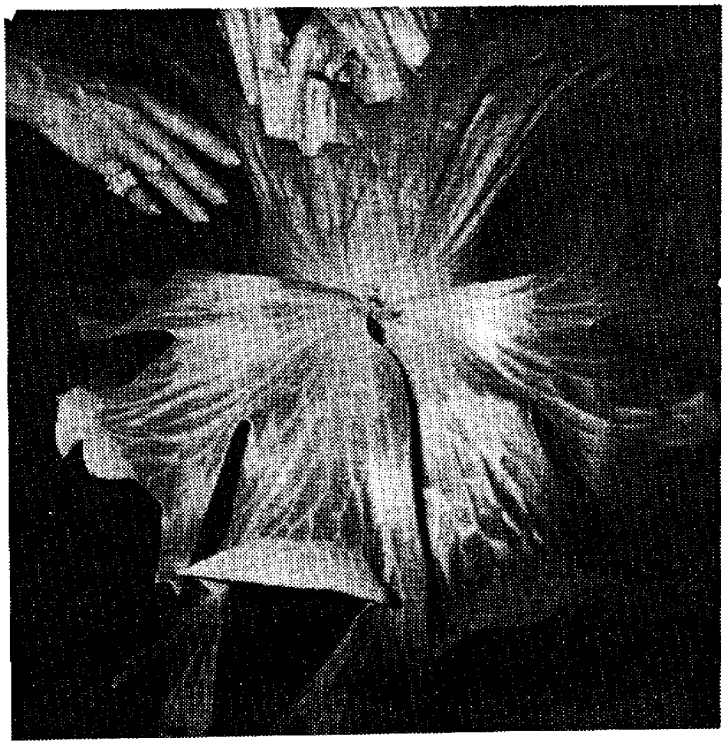


Fig. 113

A *P. wallichii* showing fertile fronds. On this plant each has three lobes, two of which have spore patches. Fertile fronds of this species show very prominent veins.

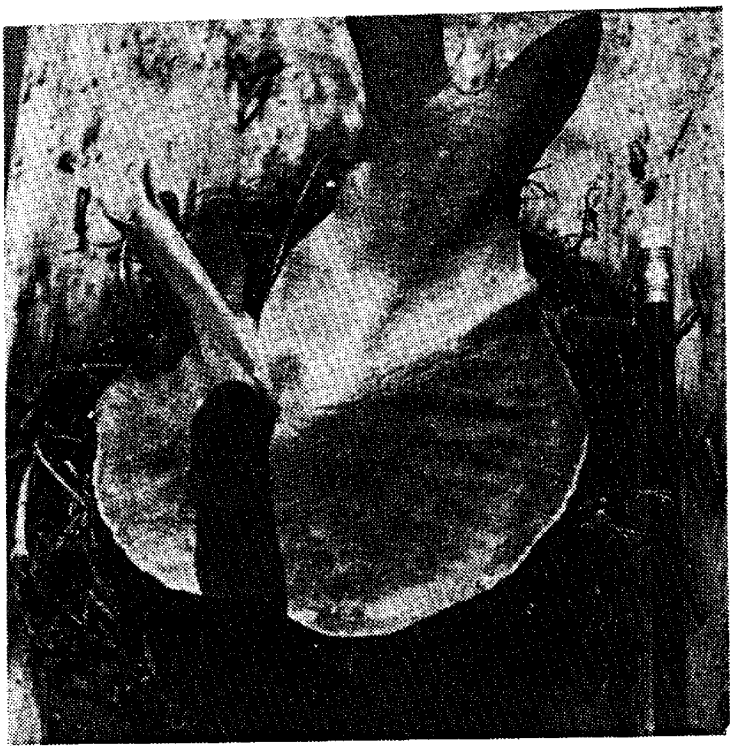


Fig. 114

Small *P. wallichii* sporeling with a fertile frond.

Fig. 115

P. wallichii spore patch from underneath.

Few hobbyists grow *P. wallichii* successfully. It may die from rots, but more often it goes into dormancy and never comes out. There is little agreement among those who grow *P. wallichii* successfully on how the species should be treated. One gives it no water while dormant, another keeps it watered well all year so it does not go dormant. More experiences are needed.

Importers report plants from India are smaller and more apt to go dormant than those from Thailand. Since in Thailand it grows together with *P. holttumii*, plants from there should be adapted to the same conditions as *P. holttumii*, monsoon forests with definite wet and dry seasons. Plants from India are collected from near the border of Burma and China, out of the tropics, where they grow on rocks as well as trees. It could be that cool temperatures during dormancy are important to those plants.

Fig. 117

P. wallichii with a fertile frond with many lobes. Only the first two have spore patches. This fertile frond is so wide that it has joined the group of shields. The pen is for size.

The future of this species in the hobby probably depends more on sporelings being raised under cultivation here than on imports. These plants could be better conditioned to the environment in collections. The spore are green, an indication they do not live long. They germinate quickly. Sporelings, under very moist conditions, have volunteered, causing the author to suggest that a pad of moist moss kept below a spore patch might develop some.

Hennipman and Roos consider *P. wallichii* to be most closely related to *P. elephantotis*. Hoshizaki in an earlier study put it closer to the *P. superbum* group.

P. wallichii must be considered a difficult species, prone to rots and permanent dormancy. More experience with it is needed. It seems safest to obtain plants from Thailand or sporelings.

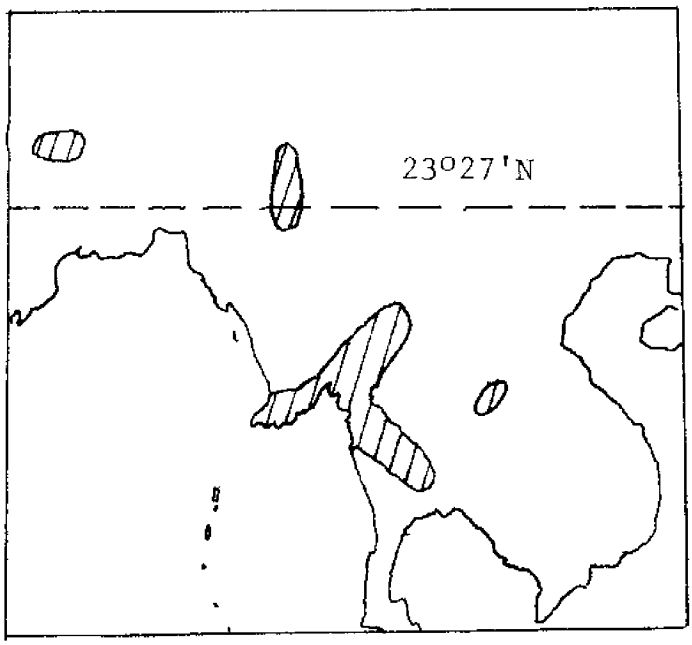


Fig. 116

The distribution of *P. wallichii* in India, Burma, Thailand, and the Yunnan Province of China. The dotted line is the Tropic of Cancer.

Platycerium wandae

(wan-dee)

Common Name: Queen Staghorn

P. wandae, the largest *Platycerium*, becomes about 1/3 larger than *P. superbum*. The shield fronds are very upright and lobed along the top. They form a basket. The fertile fronds are like those of *P. holttumii*, with two lobes, the smaller elevated. Each lobe has a brown spore patch.

Closely related to *P. superbum*, *P. holttumii*, and *P. grande*, this species is distinct in its size, and by having little points on the edges of its shields at the bud. It may have to become 45 cm. (18 in.) tall before the points show. *P. wandae* forms fertile fronds at a much smaller size than the other three species.

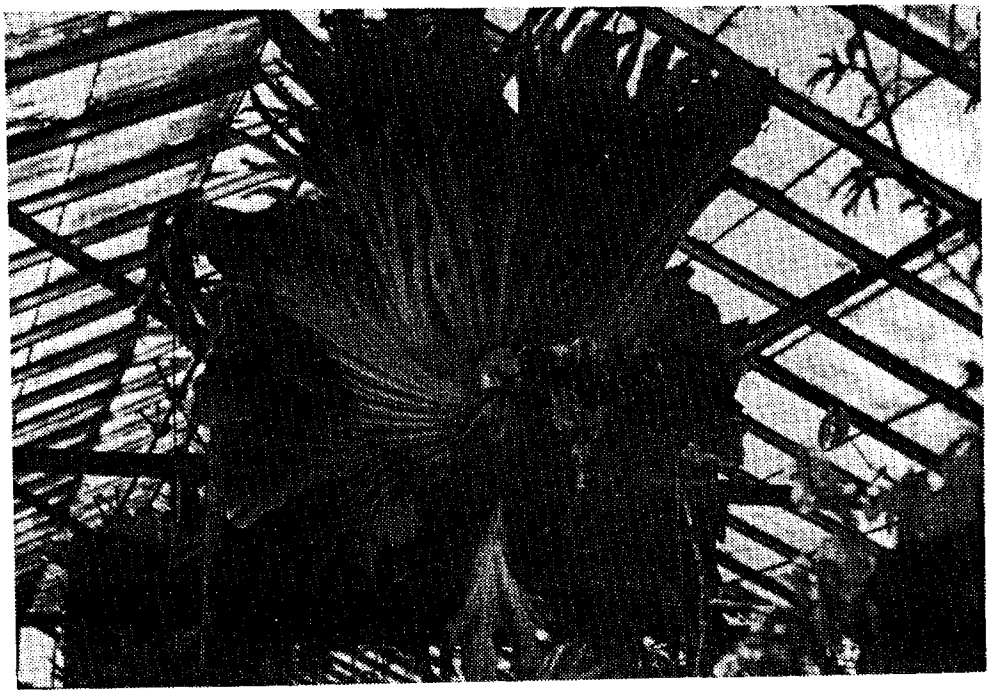


Fig. 118

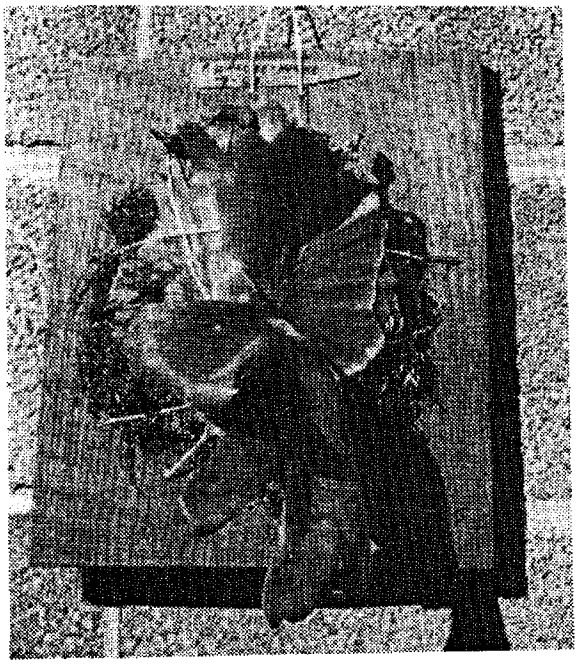
This giant *P. wandae* in a California greenhouse is thought to be the first imported into this country. It is the one survivor of two tiny plants received in 1960. At the time of this photo is was about in need of a trim, as shown on page 98.

Fig. 119

The edges of the shield fronds form many frills at the bud of *P. wandae*.

Fig. 120

P. wandae forms fertile fronds at a smaller size than any of the other giant *Platycerium*.



Adequate space is the main requirement for growing *P. wandae*. It is almost as sensitive to overwatering as *P. superbum*, but not as prone to shipping damage as *P. holttumii*. Its temperature range is not as low as *P. superbum*. Otherwise, the culture methods for *P. wandae* are the same as for *P. superbum*.

P. wandae is not often imported. Nearly all of the plants in the trade are cultivated sporelings. Spore culture is not particularly difficult. Sporophytes form quickly.

To the hobbyist with enough space, *P. wandae* is a handsome and not difficult *Platycerium*.

Fig. 121

The fertile frond of *P. wandae* has two lobes. One is elevated, and each has a spore patch. The top edge of the ruler is marked in centimeters.

Photo by
Ralph Hughes

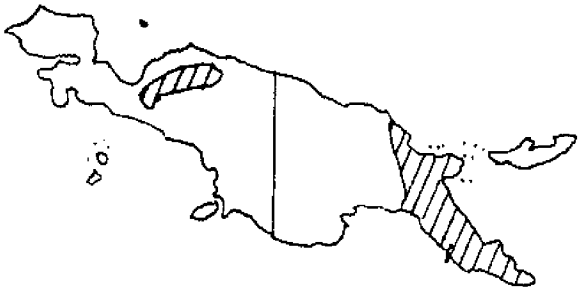


Fig. 122

Distribution of *P. wandae* on New Guinea. The eastern part is probably due to introduction by man.

Platycerium willinckii

(wil-lin-key-eye)

Common Name: Java Staghorn

P. willinckii is very closely related to *P. bifurcatum*. Its shields are different by being very tall, deeply lobed, and often having their tops lose all the tissue except the veins. Its fertile fronds are different by hanging down, and being very long.

The fertile fronds tend to grow edgewise at the bud and then arch down. They have more hair on the underside. Some *P. willinckii* develop a wide, flat group of pointed, curved fingers at the ends of the fertile fronds. Those with very long fertile fronds are probably the extreme form of the natural population, but they are also the most distinctive for the hobbyist. The fertile frond length is affected somewhat by how many are allowed to develop. The largest and most magnificent specimen of *P. willinckii* this author has ever seen is the one shown on the back cover, being held by its owner, Ralph Hughes. The next summer it had more fertile fronds, but each was slightly shorter.

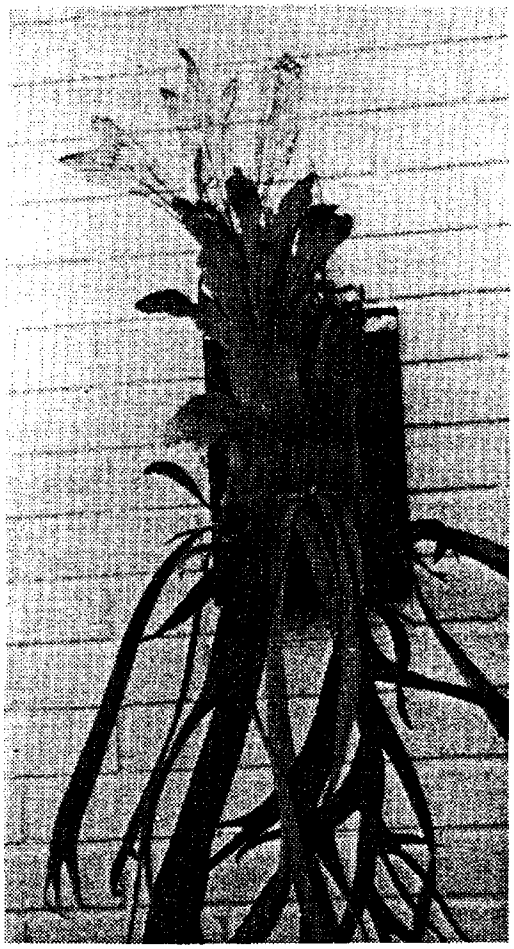


Fig. 123

Tall shield fronds of *P. willinckii* are soon left as only a network of veins.

The bud of *P. willinckii* is rather small. This species may remain inactive for quite some time after being shipped, and the small bud is apt to cause the new owner to consider the plant dead.

Growing *P. willinckii* offers no specific problems. It forms pups, but not as freely as *P. bifurcatum*. It does well in medium light, moist moss, and is not prone to rot. It cannot be expected to grow as quickly as, or take temperatures as low as *P. bifurcatum*. Plants in the trade are pups from early importations. It is almost never imported now, or grown from spore. This species is called *P. bifurcatum* spp. *willinckii* by Hennipman and Roos.

P. willinckii is a distinctive, pretty, and easy *Platycerium*, highly recommended.

Fig. 124

P. willinckii has a small bud. Growing downward, and edgewise is a new fertile frond, white with hair.

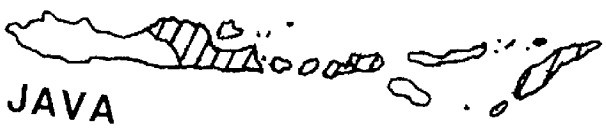


Fig. 125

Range of *P. willinckii*.

A starting hobbyist should consider trying the different species of *Platycerium* according to their level of difficulty. Below is an attempt to rank them.

Level One, easiest:
P. alcicorne, P. bifurcatum, P. hillii, P. veitchii
P. willinckii

Level Two, fairly easy:
P. superbum, P. grande, P. wandae

Level Three, not difficult, but require some experience:
P. andinum, P. elephantotis, P. ellisii, P. holttumii
P. stemaria

Level Four, somewhat difficult:
*P. coronarium, P. madagascariense**

Level Five, difficult, or little understood:
P. quadridichotomum, P. ridleyi, P. wallichii

* Must be kept entirely free of pests.

For additional reading:

Coats Alice M., 1969, The Plant Hunters, McGraw-Hill, N.Y.

Craig, Jack. Sept. 1977, In Search of *P. ridleyi*, *LAIFS Journal*, Vol. 4 (9) 238-240 Collecting in Malaysia.

Graf, Alfred Byrd, 1981, Tropica, Second Edition, Roehrs Co. East Rutherford NJ, 07073, Pages 449-453.

Hoshizaki, Barbara Joe. 1972. Morophology and Phylogeny of *Platycerium* Species. *Biotropica*, 4: 93-117 Contains a key to species, and a diagram of species relationships.

Hughes, Ralph H., Dec. 1982. *Platycerium superbum* in the Wild and in Cultivation. *Fiddlehead Forum* Vol. 9(6) 42-44

Hughes, Ralph H., 1983, *Platycerium bifurcatum* in the Wild and the Home, *The British Pterilogical Society Bulletin*, Vol. 2(5) 257-261

Hughes, Ralph H., 1984, *Platycerium bifurcatum* in the Wild and in Cultivation. *Fiddlehead Forum*, Sept-Oct. -in press

Fogg, H. G. Wilham, 1976, History of Popular Garden Plants from A to Z, A. S. Barnes & Co., N.Y. A nice section on James Veitch, nothing on *Platycerium*.

Franken, N. A. P., and Roos, M. C., 1982, The First Record of *Platycerium ridleyi* in Sumatera. *American Fern Journal*, Vol. 72(1) 12-14

Franks, Wendy, 1975, Platycerium Fern Facts

Fern Lesson, 1979, *Platycerium ridleyi*, *LAIFS Journal*, Vol. 6(Sept.) 271-276

Joe (Hoshizaki), Barbara, 1964, A Review of the Species of *Platycerium*, *Baileya*, 12(3) 69-126. A classic paper.

Joncheere G. J. 1968 Notes on *Platycerium* II, *P. willhelminae-reginae* Reduced to *P. wandae*, *Blumea*, Vol. XVI(1) 110-114

Joncheere, G. J., and Hennipman, E., 1970, Two New Species of *Platycerium* and the identification of *P. grande*. *British Fern Gazette* 10:113-118

Lind, E. M., and Morrison, E. S., 1974. East Africa Vegetation, Longman Group Limited, London. Contains maps, vegetation types, and has a paragraph on *P. elephantotis* on Page 16.

Tryon, Rolla M., and Tryon, Alice F., 1982, Ferns and Allied Plants, Springer-Verlag, New York, 739-743. *P. andinum* only, photos of habitat, microscope pictures of spore, stellate hairs, and chromosomes. Lists elevation as 100 to 1200 meters (325 to 3900 feet) for this species.

For additional reading:

A. Difficult to obtain in this country

Hennipman, E., and Roos, M. C., 1982, A Monograph of the Fern Genus *Platycerium*, North Holland Publishing Company, Amsterdam, 126 pages, ISBN 0-4448-5569-6

Any paper in *Blumea* may be difficult to obtain.

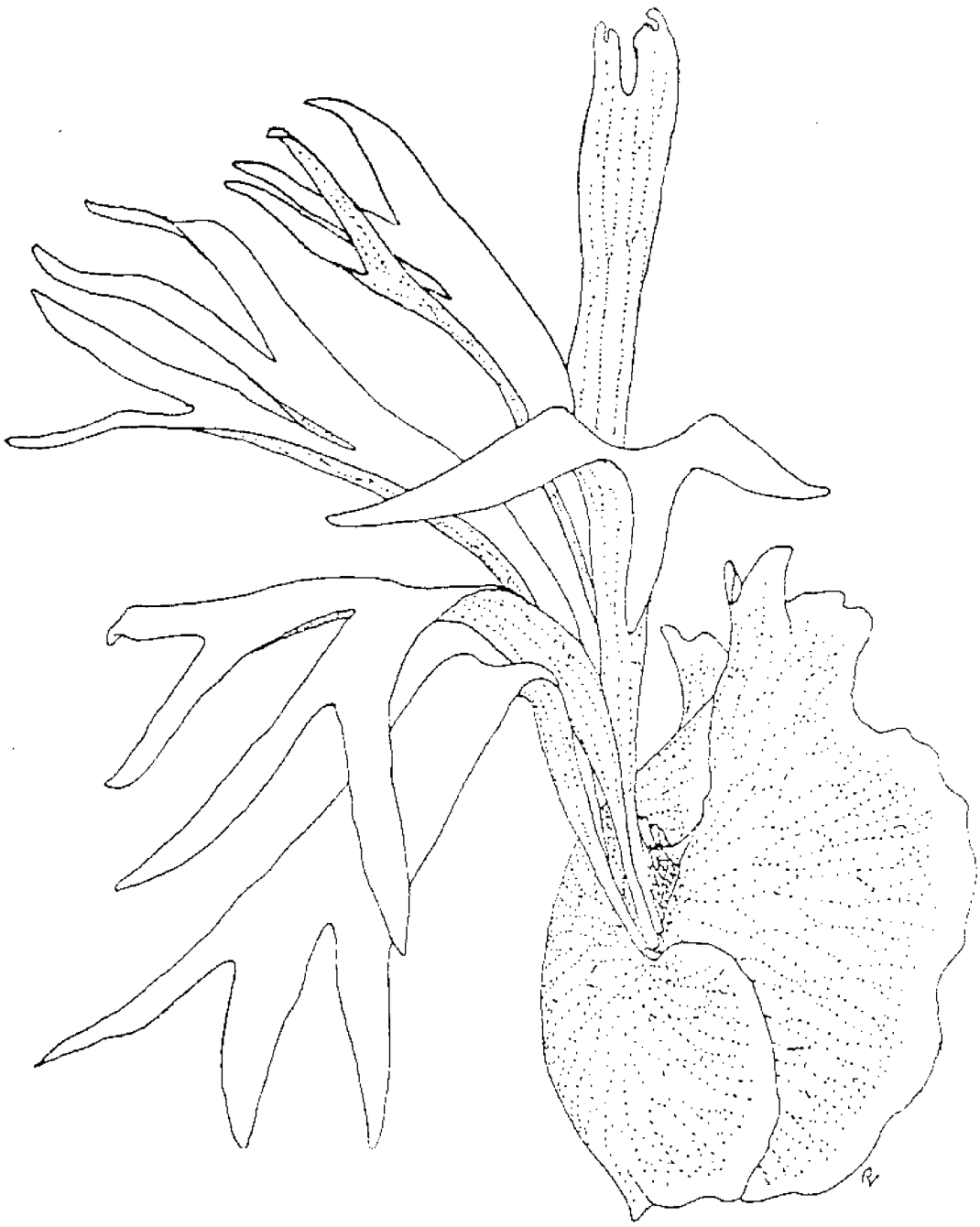
B. Rare

Amburro, Dr. Cartallaya, about 1981, El Genus *Platycerium* (Servio), in Spanish, University of Columbia, Bogota, One copy of this book was received in the U.S.A., loaned, and lost. Letters to the University of Columbia addressed to its author are returned. Other sources in South America have not been able to locate the book.

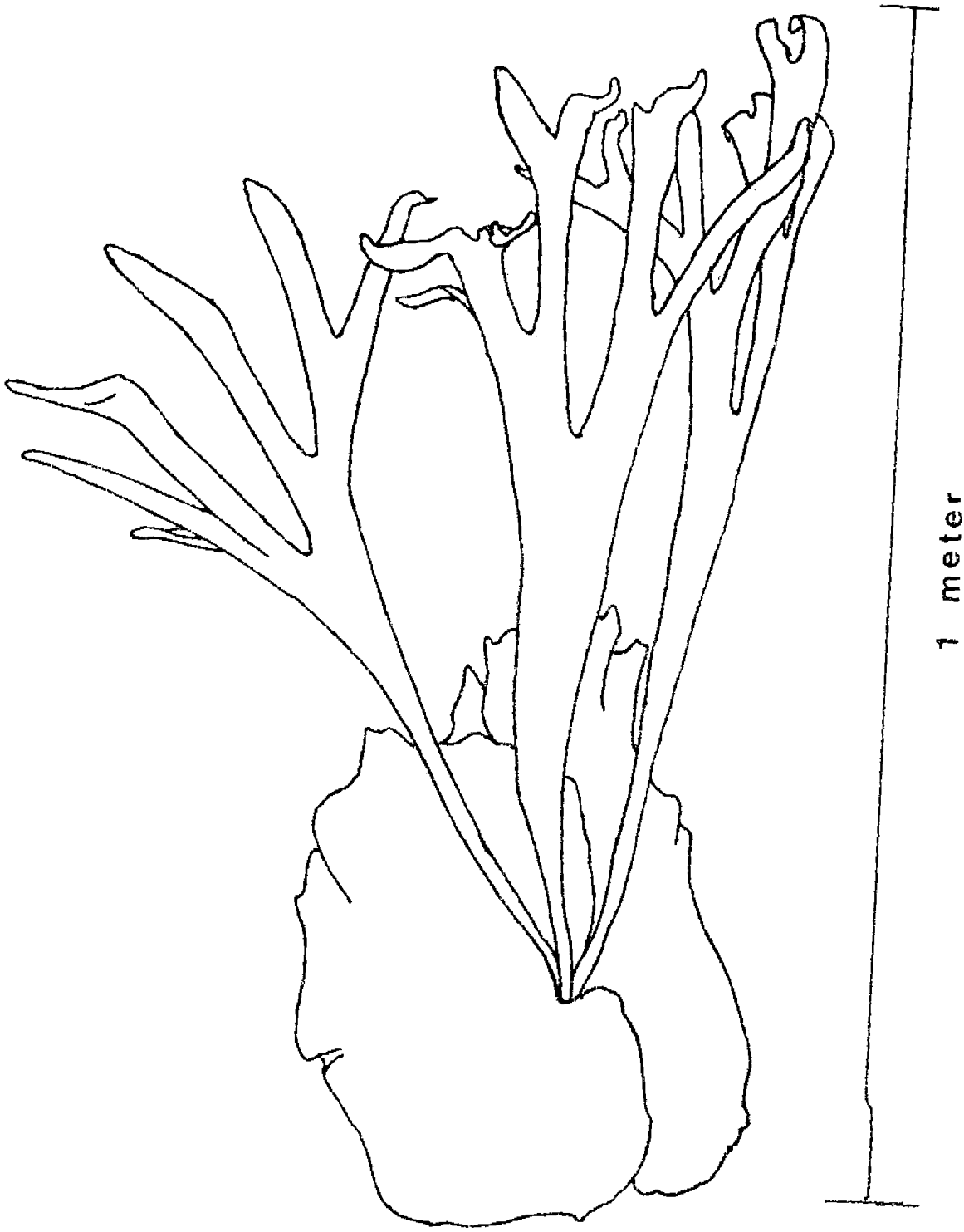
Lecoufle, Marcel, Revision Du Genre *Platycerium*, *Revue Horticole*, 1965 numbers 2264, 2265, 2267, and 2269; 1966 numbers 2270 and 2274. A six part series, in French, very complete review, 17 species, 8 cultivars.

CHAPTER 5

CULTIVARS



LA REUNION



P. bifurcatum cv. Majus

three of ten fertile fronds

INTRODUCTION

There are two general directions a *Platycerium* hobby can go. One is to try to obtain and grow all eighteen species. This tends to be expensive both in the cost of the plants and the cost of maintaining the conditions some of them require. Failures will be experienced with difficult species. The other is to concentrate on cultivars. Success is far more assured in this direction. It is possible to build a very interesting and rewarding *Platycerium* cultivar collection, but the hobbyist, when considering buying a new cultivar, should insist on seeing mature plants, grown under normal conditions, as proof it retains its unique traits.

Cultivars are forms of a species, made in cultivation.* Some cultivars have simply arisen accidentally in cultivation, been noticed and propagated. Examples are: Magnificent, and Horne's Delight. Others have been around so long no one is sure where they came from, like *P. bifurcatum* cv. Florida and *P. bifurcatum* cv. San Diego.

Definite recorded attempts to form cultivars start in the San Diego,California area with Mr. Charles Lewis Cass about 1940. When making the Cass cultivars he mixed the spores of four types of *Platycerium, P. stemaria, P. superbum, P. hillii,* and *P. bifurcatum* cv. San Diego. He put the spore on a boiled red brick in a cake pan of water with glass over it. The assumption was with prothallia of different species so close together, the sperm could cross from one prothallium to

- - - - -

*It is difficult to see how a cultivar of a species that only reproduces by spores could retain its distinctive traits. Propagating a cultivar depends on keeping a special gene combination together. Meiosis, the type of cell division used in spore formation, has the function of mixing genes which would destroy the special gene combination of the cultivar. Pups however are formed directly from the cells of the parent plant using mitosis, a type of cell division which only duplicates genes, giving pups the same special gene combination as the parent plant.

another and hybrids would be formed. The results were the Cass cultivars. Only one looked at all like *P. superbum* and it was discarded. Mr. Cass gave ten of the cultivars to the late nurseryman, Albert Wilson, who numbered them Cass 1 through Cass 10 according to size, Cass 1 the largest, Cass 10 the smallest. When Mr. Cass died he willed his plants to Mrs. Dorothy Behrends of Encinitas, California.* She numbered the rest B-11 through B-59. The "B" is for Behrends. So, the total number of Cass cultivars is 59. Later she changed some of her numbers to names. Dorthy Behrends allowed Steve Talnadge, a nurseryman from Chula Vista, California, to take two pups from all the Cass cultivars he wanted, and has given pups to a few close friends, but otherwise she has protected the Cass cultivars.

Steve Talnadge sold plants of the Cass cultivars under the names given by Dorothy Behrends. However, to other Cass cultivars he assigned his own numbers, Cass T#1 through an unknown number.

Marshall D. Gresham, in Encinitas, California mixed the spores of *P. bifurcatum* cv. Majus and *P. stemaria* in 1943, obtaining a great variety of cultivars. He threw the whole group away, in a spot near the railroad tracks, and later retrieved some of them. Only one, which has his name, is now available.

The nursery of Sylvia Leatherman and her husband, in South El Monte, California was very active in ferns, and also formed cultivars of *Platycerium*. When the stock of this nursery was obtained by The Plant Shop's Botanical Garden, in Reseda, California, the *Platycerium* cultivars were in a state of disarray and most have been lost.

- - - - -

*A Liquor Control Agent, Mr. Cass once made an arrest which involved some local political figure, after which he was transferred to Santa Barbara. He also sold cacti and succulents, cheaply. He was never used to having much money. Late in his life he inherited a large sum of money. Some who knew him feel his worrying over the money contributed significantly to his death in 1952.

Robert Oman, in his nursery in Miami, Florida, has grown ferns from spores for many years and has formed several cultivars, most with wide fertile fronds. He has also located cultivars in the Miami area and put them in the trade.

Steve Talnadge of Chula Vista, California, operated Talnadge Fern Nursery for many years and named many cultivars, most forms of *P. hillii*. Talnadge also became very interested in Bromeliads. On his retirement in the late 1970's, no other nursery made a firm commitment to buy and propagate his *Platycerium* cultivars, so they were gradually sold. About one-hundred selections, which included both Talnadge and Cass cultivars, were purchased by Ralph Hughes, from 1976 to 1978, and taken to southwest Florida. Another group was taken to Houston, Texas by Ted Wills.

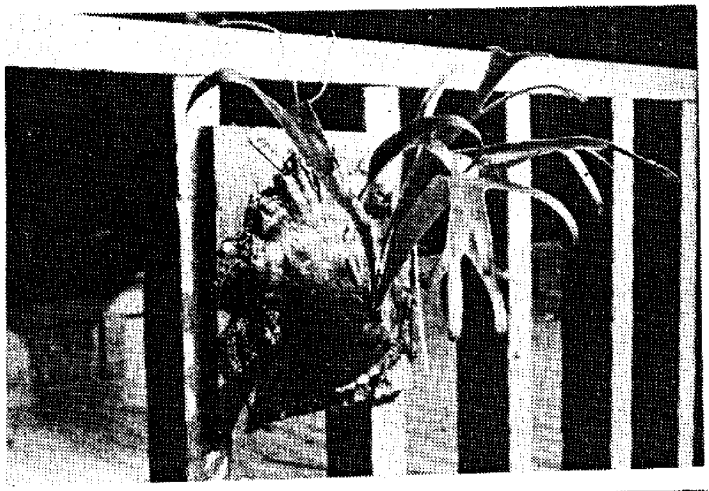
The value of a cultivar is measured by how distinct it is from those already available, how stable its traits are, how easily it grows, and how readily it forms pups. It takes years to test a cultivar. Often its distinctive traits are due only to the environment where it was grown rather than new gene combinations in it. If this is the case, when it is grown side by side with other cultivars, and under the same conditions, the distinctive traits of the new one gradually disappear.

If this book gave a description of a cultivar, that cultivar would then be offically published. This is not the author's intent. The purpose of this Chapter is to convey information to the hobbyist about the appearance of plants that go with the names in the trade and in collections. So, this Chapter contains only labeled photos and historical notes.

It is incorrect to name a cultivar using a Latinized or Latin descriptive word, like "Erectifolia" or "Kingii." However it was not practical for the author to correct or eliminate such names.

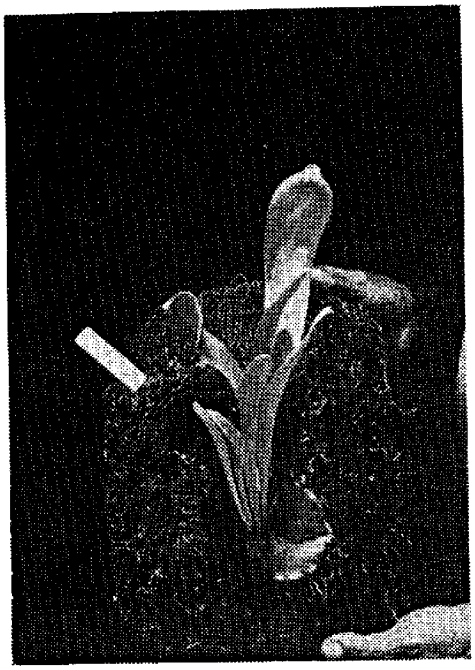
It had to be assumed the labels found on plants were correct. However, it was impossible to verify that those with island names were actually from the islands their labels indicated. Also it is likely several of the names here originated as labels identifying from whom plants were obtained, and have been carried along as pups of the plants were traded.

THE CULTIVARS



b.

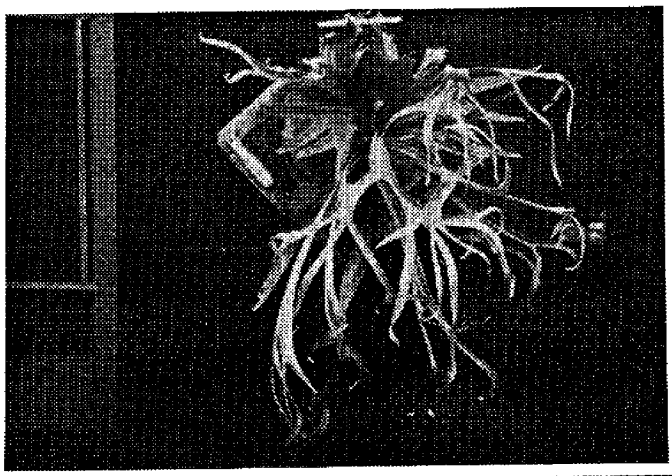
c.



a.

a. *P. willinckii* cv Amphostemon
   David Miller photo
b. Aquatencia
c. Australia One, or Australia
   White Back
(For Alcicorne see San Diego)

a.



b.

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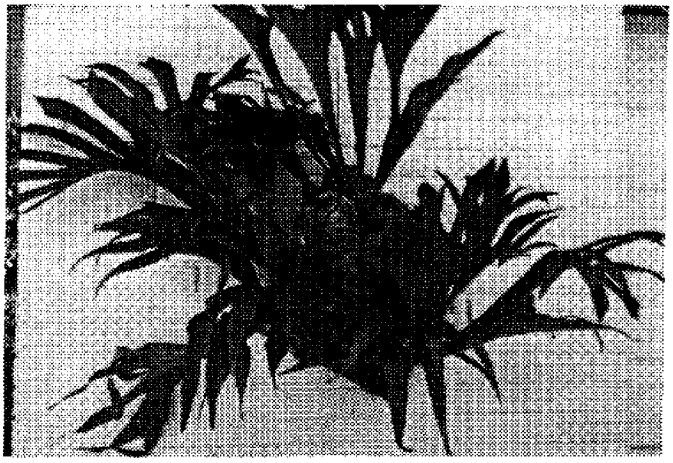
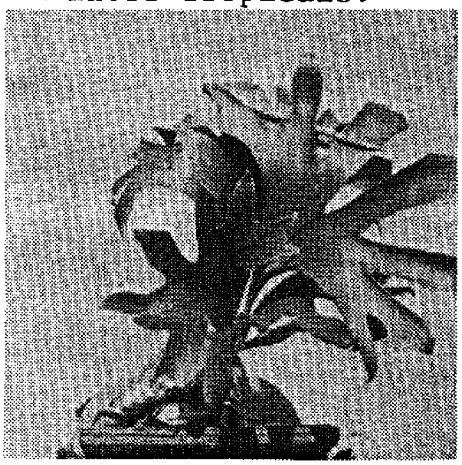


f. Volunteer sporeling for the now retired Jim Bloom, who had a nursery in south Florida.

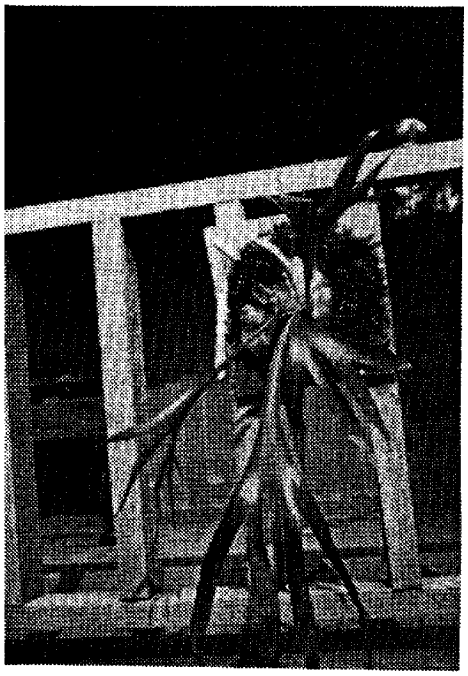
a. Bahia (Talnadge)
b. Baileyi
c. Belgium Hybrid
d. Bell
e. Big Foot
f. Bloomėi

Bloomei Fingers
(Glasshouse Works)*
The Glasshouse Works is related to Country Hills Greenhouse.

P. veitchii cv. Bollet
David Miller photo
David Miller, in North Carolina formerly shipped *Platycerium* as Millers Tropicals.



Caguas Nursery
A nursery in Puerto Rico.

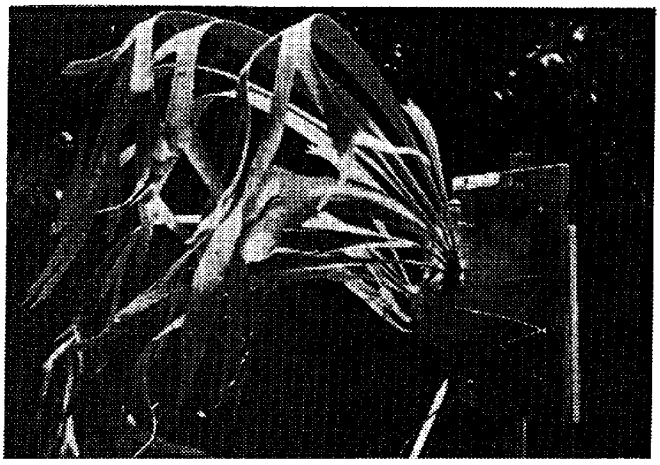


Bloomei Type I
(Ron Arant)

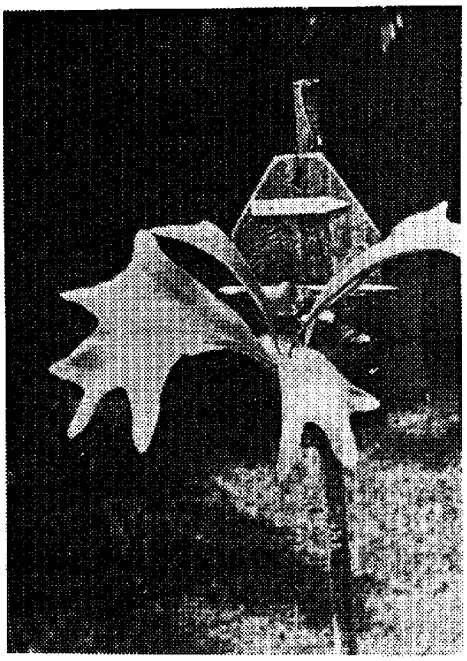
Ron Arant operated Arant's Exotic Greenhouses, in Bessemer, Alabama, until they were heavily damaged by a storm in 1983.

Blue Boy (Talnadge)

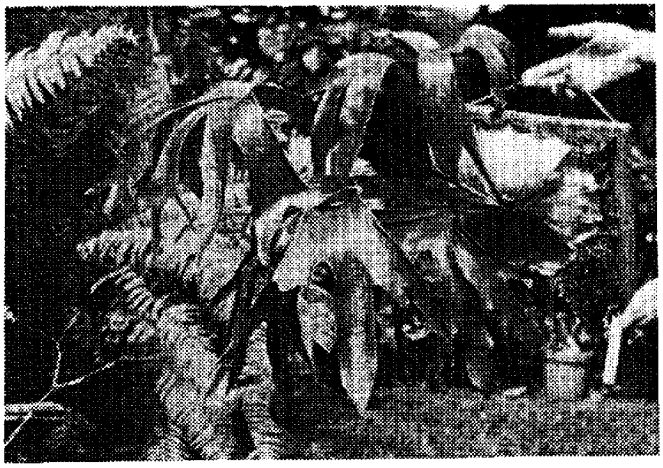
*Names in parentheses are of those who named the cultivar.



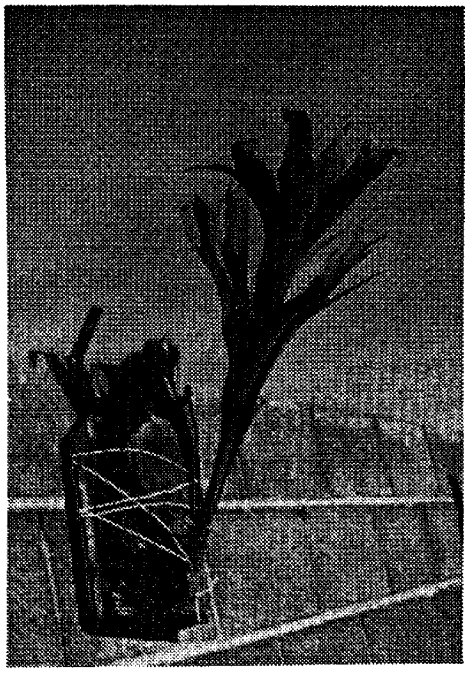
Dr. Carl's *bifurcatum*



Dr. Carl's *hillii*



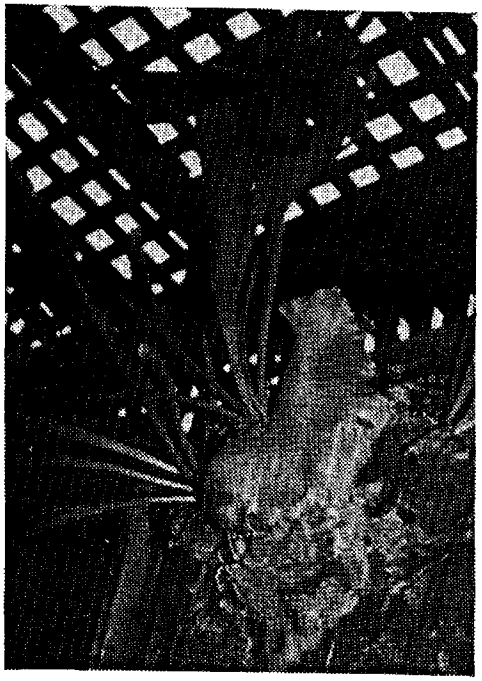
Cascade (Oman)



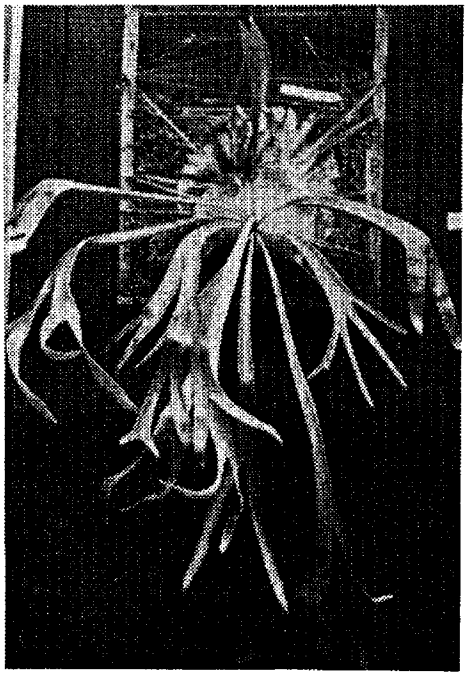
Cass 1

Cass 2

a.



b.

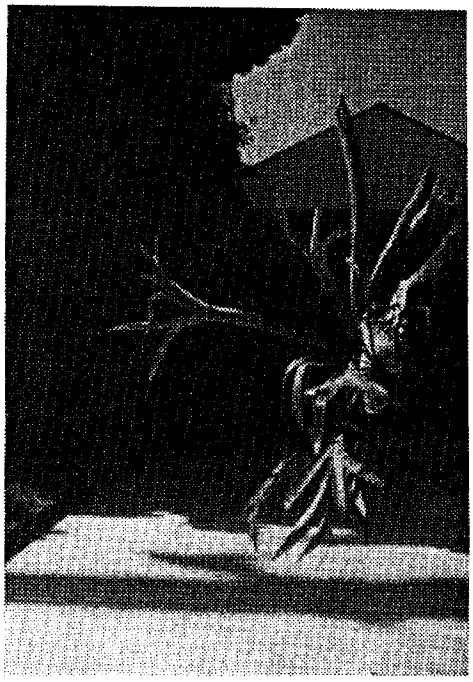


c.

a. Cass 3
b. Cass 4
c. Cass 5
d. Cass 6
e. Cass 7

d.

e.



a.

b.

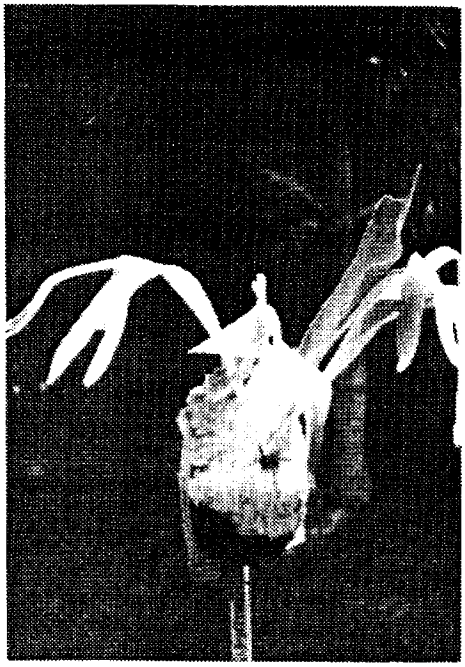
a. Cass 8
b. Cass B-22

c. d.

e.

c. Cass B-32
d. Cass B-38
e. Cass B-39
f. Cass B-51

f.

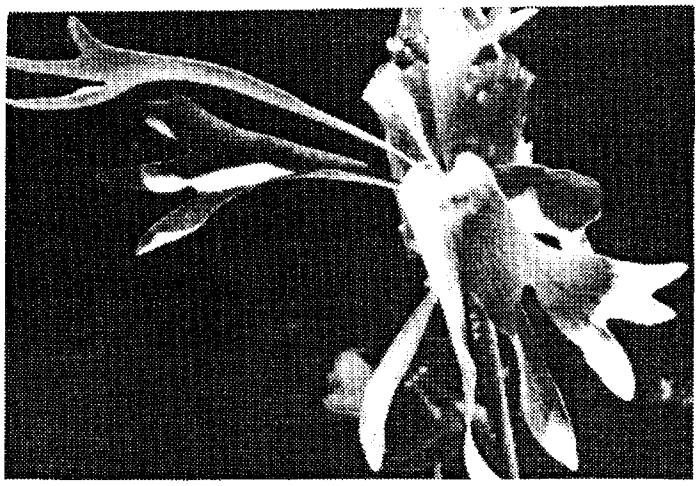


Cass T #1
(Talnadge number)

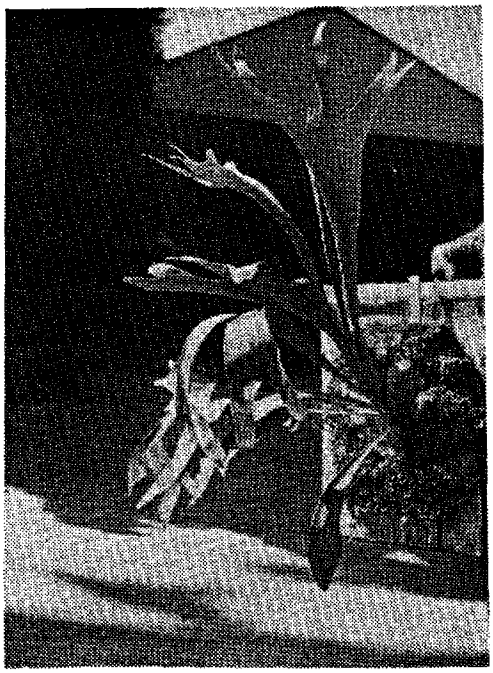
Cass T #2

Cass T#4

Cass T#5



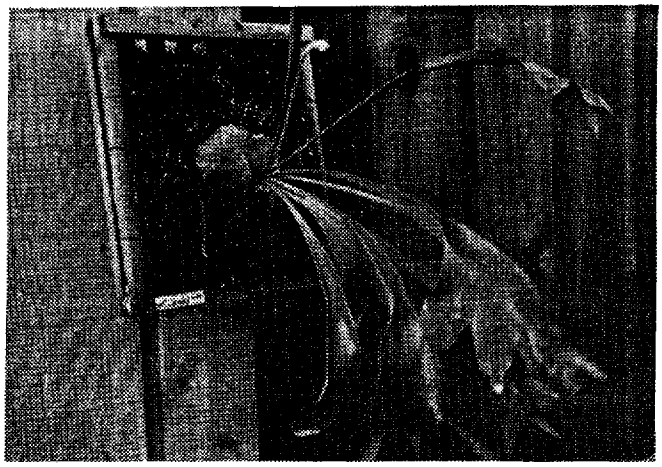
Cass T#8



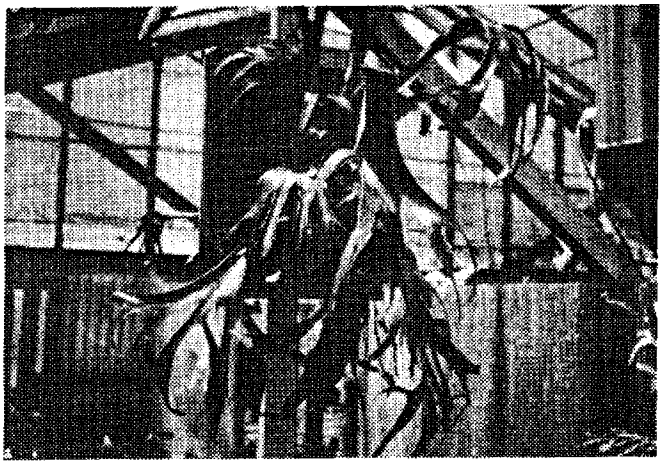
Cass Aloha

Cass Alta

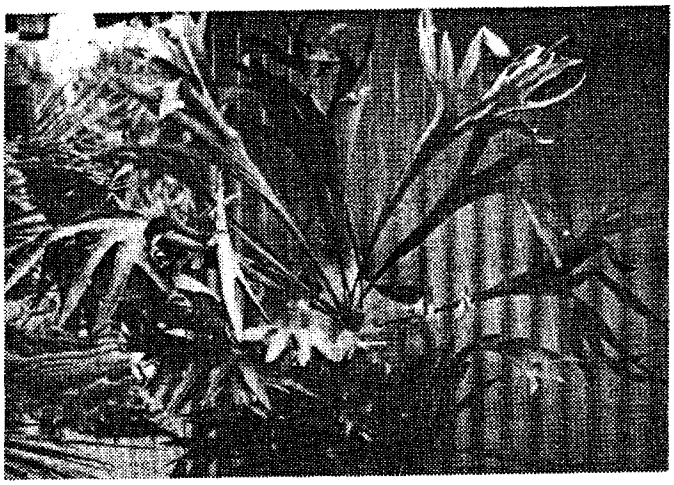
Cass Carlos



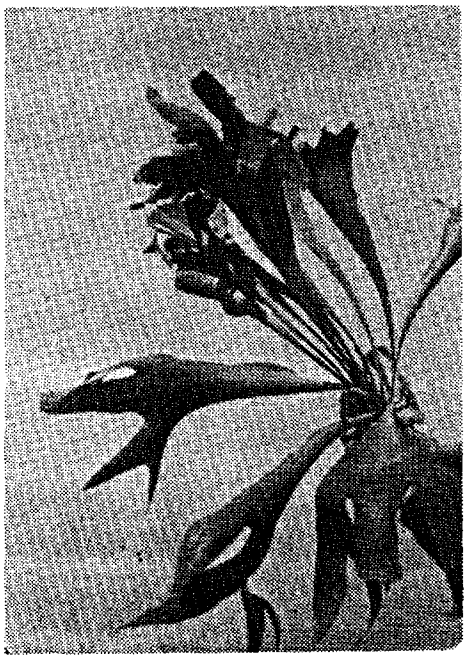
Cass Carlos (also)



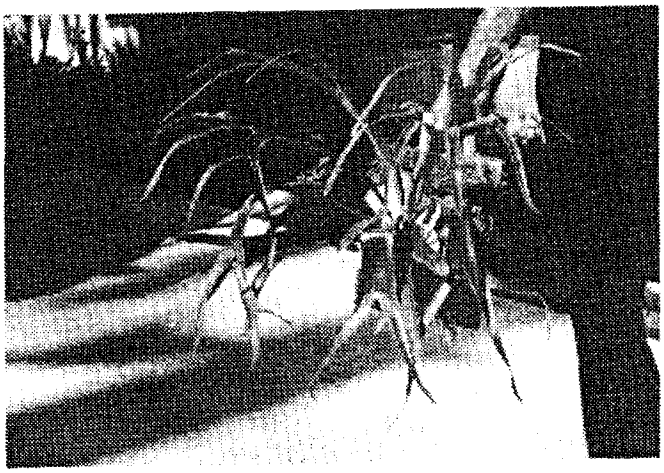
Cass Crossfingers
(Local California name)



Cass Jumbo
(Local California name)

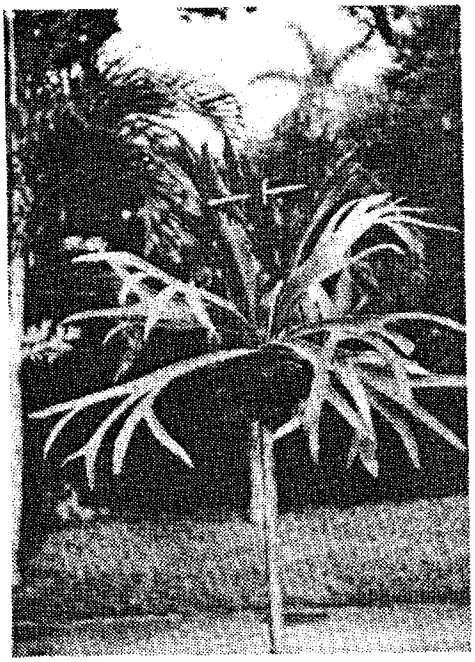


Cass Lindo

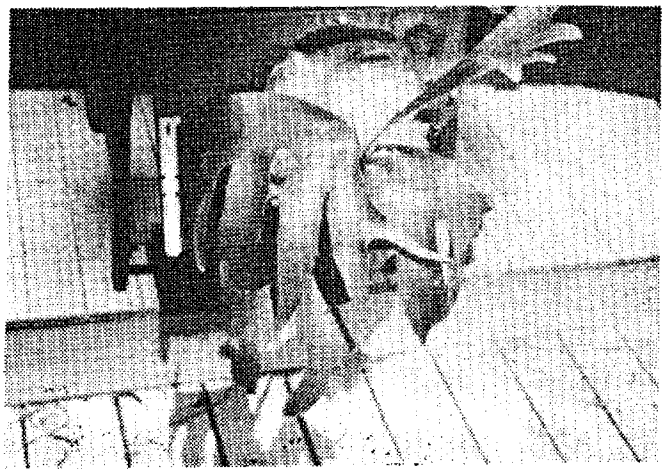


Cass Robusta

Cass Ropa



Cavalier (Talnadge



Chestnut (Hermine Stover)

a.

CELEBES ISLAND

There are two "Celebes" in southern California. One is from John Roach who got it from a merchant marine who brought it from the island for his mother in Long Beach, in about 1967. Mr. Roach considers it a separate species. "Roach's Tips" is the same.

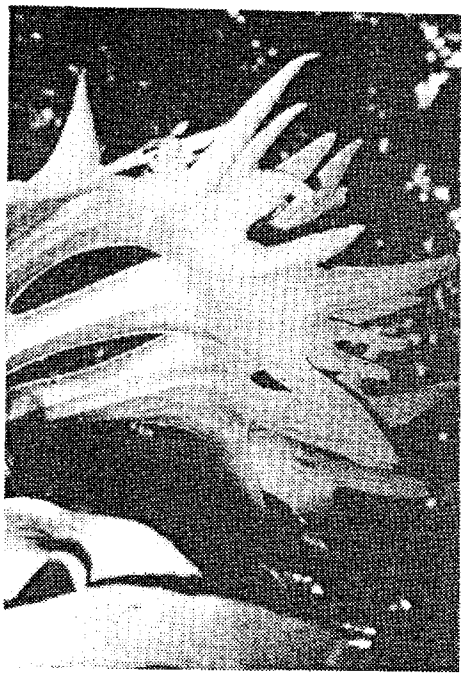
The other "Celebes" traces back to Cora Lee Walters, who had some greenhouses in Rosemead,California. Its origin is less clear.

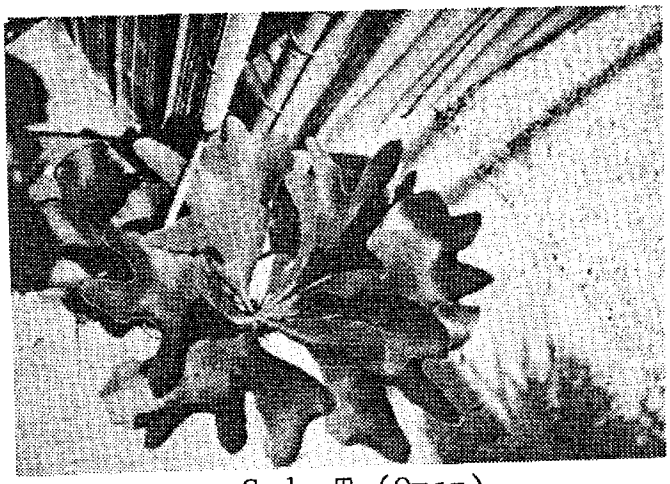
b.

a. Celebes (Roach)
b. Celebes (Walters)
c. Celebes (Walters) from above
d. Celebes (Walters) spore patch

c.

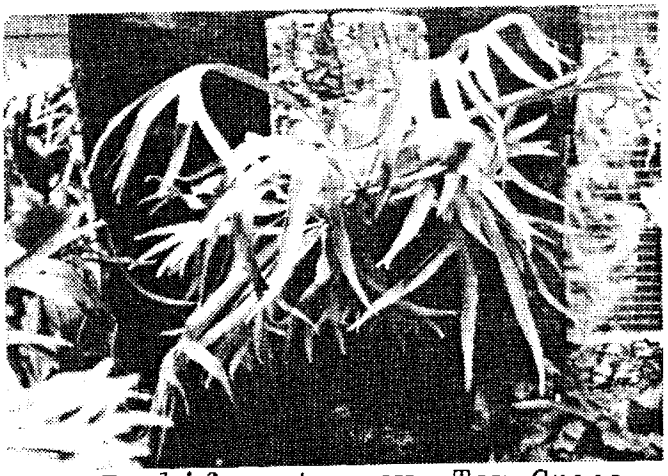
d.





Code T (Oman)
Robert Oman bought from Fantastic Gardens, propagated, and named.

P. bifurcatum cv. Cord
David Miller photo



P. bifurcatum cv. Tom Crane
David Miller photo

Mrs. "D"

Mrs. "D"

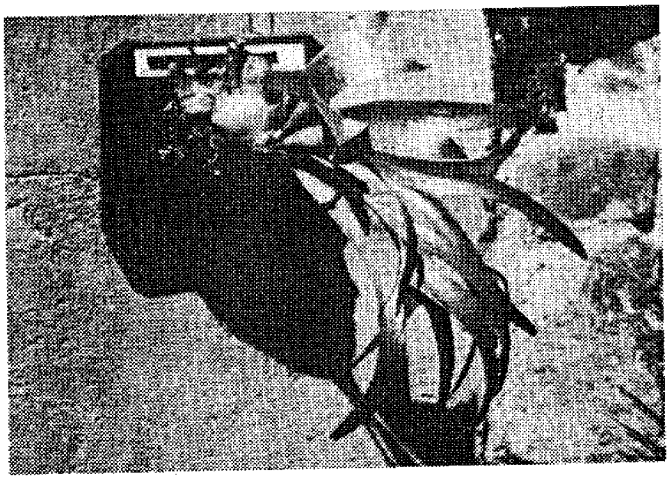
Mrs. "D" was named by Dorothy Skula of Miami, for Ruby Davis. The original plant was growing in Ruby Davis's yard. These Photos are of Dorothy Skula's stock plant.

Tom Crane has a greenhouse in northern California.

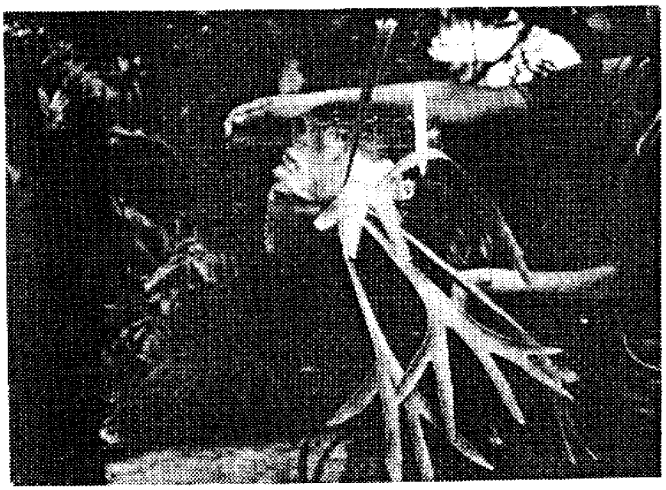
Diddell
(M. Diddell is acknowledged in Joe, 1964.)

Double Pleasure
(Talnadge)

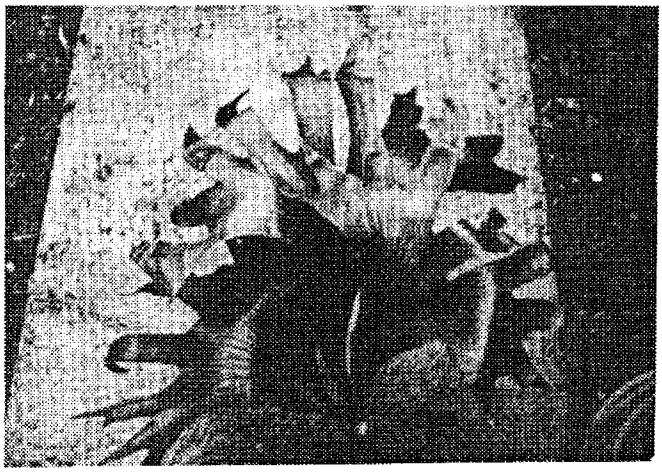
P. hillii Diversifolium
David Miller photo



P. bifurcatum Dwarf
(Horne)



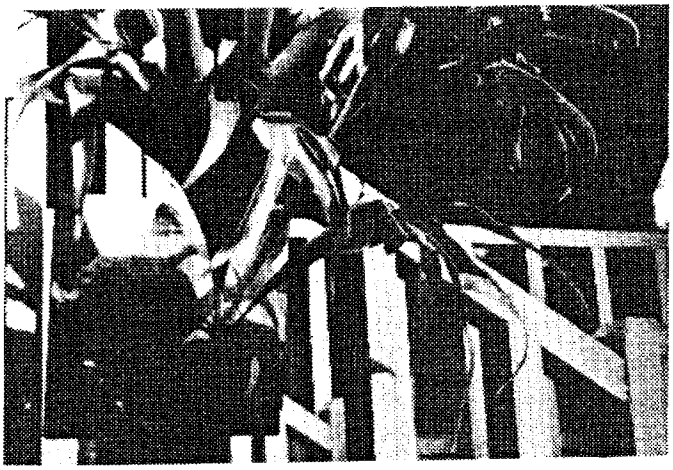
P. hillii cv. Dwarf (Roach)



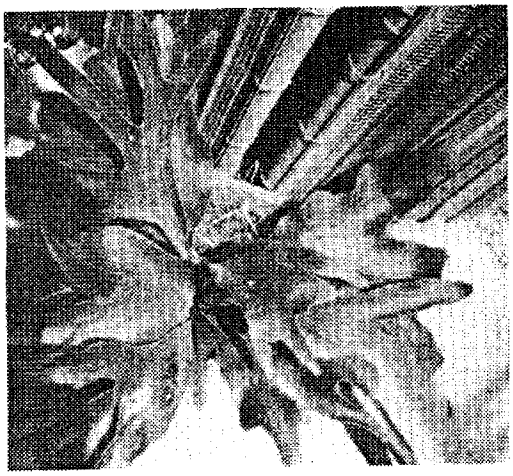
Drummond
Named for Dr. Drummond,
founder of LAIFS

Ebony *

Eppley



Erectifolia (Oman)



"E. T." (Horne) volunteer sporeling

*From the former Turner's Tropicals, in San Diego, received among plants from Florida and named.

European Hybrid

Excellence (Oman)

Fanstastic Gardens # 10

Florida -pups kept off-
Name given by Jerry Horne to a type of *P. bifurcatum* grown in southern Florida since the mid-1930's.

Florida Beauty
Talnadge received
from Florida and
named

Forgii

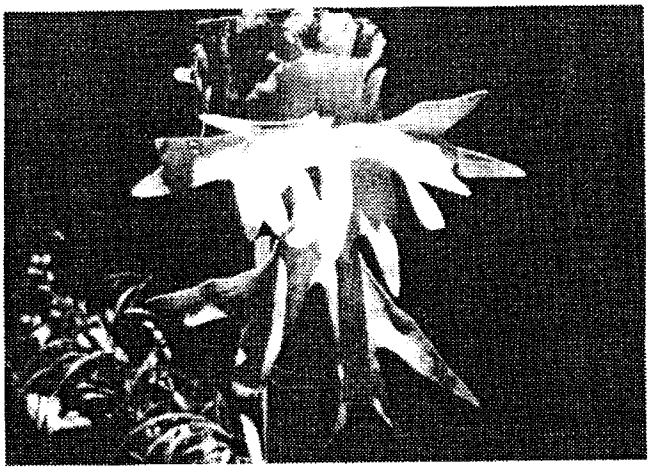
Some consider this the same as "Roberts."

Foster's #1

Foster's #1, spore patch

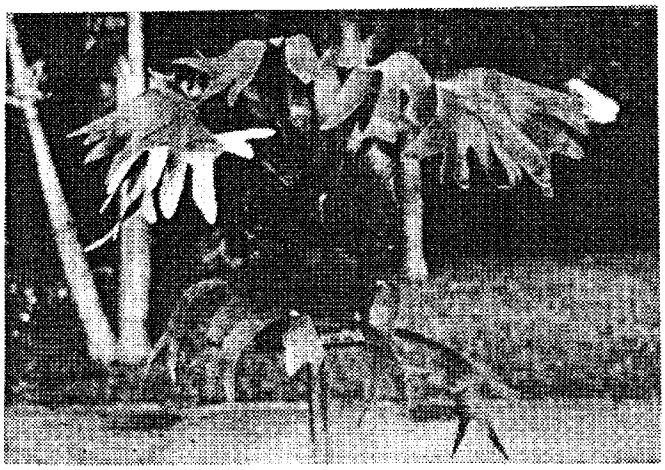
Named for the late Bert Foster, who grew bromeliads in Florida

Gee Gee (Talnadge)
(Possibly Gigi)

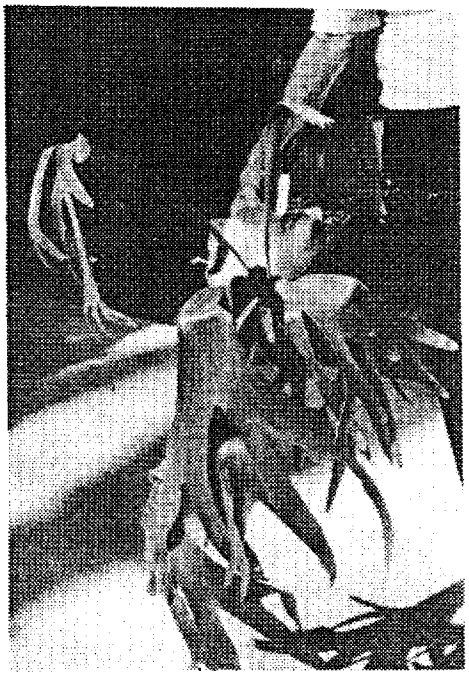


Geni

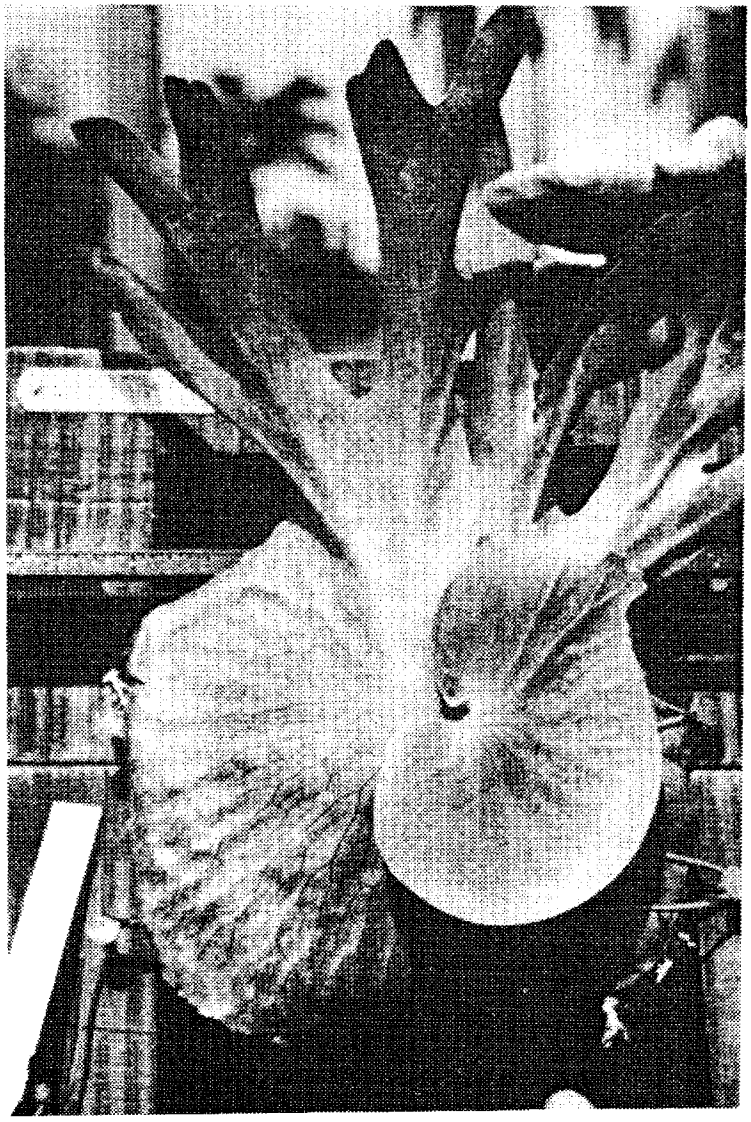
German Hybrid #1



German Hybrid #2
(Talnadge)



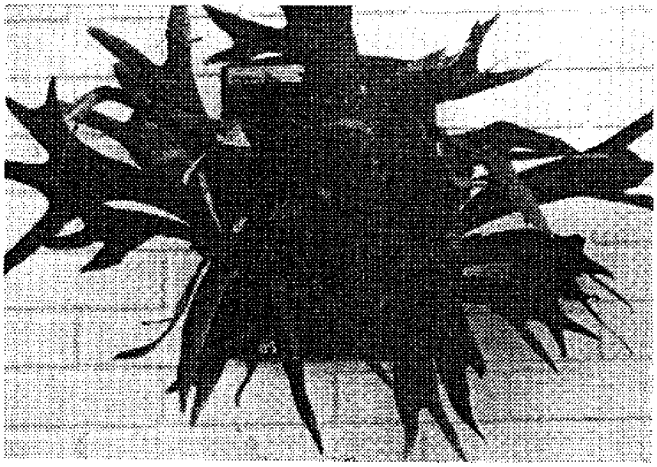
Gigantea



Glasshouse Works
Photo by Ralph Hughes
Also see page 78

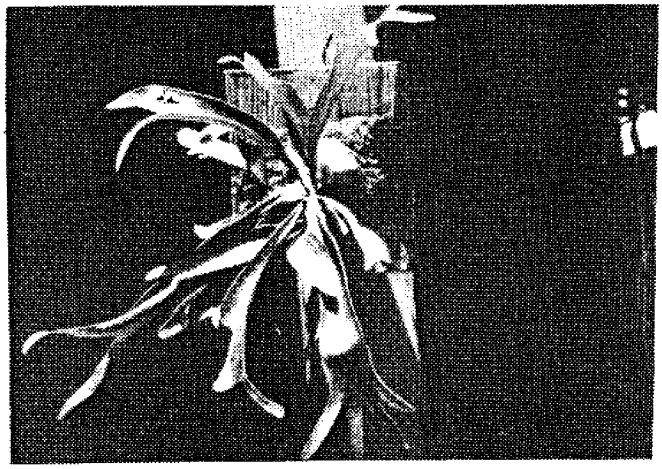
Gornto Hybrid

Gresham's

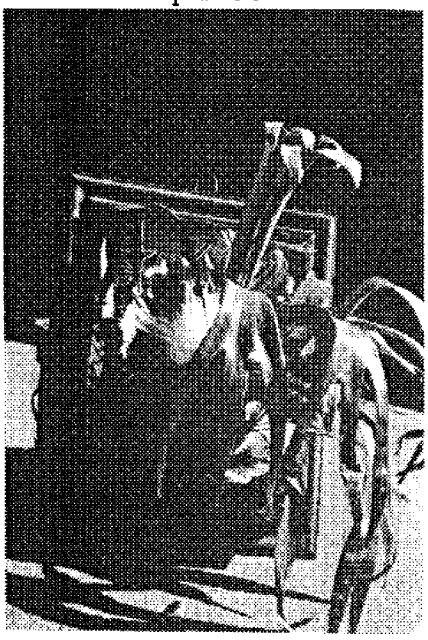


Guam (Horne)
from there ?

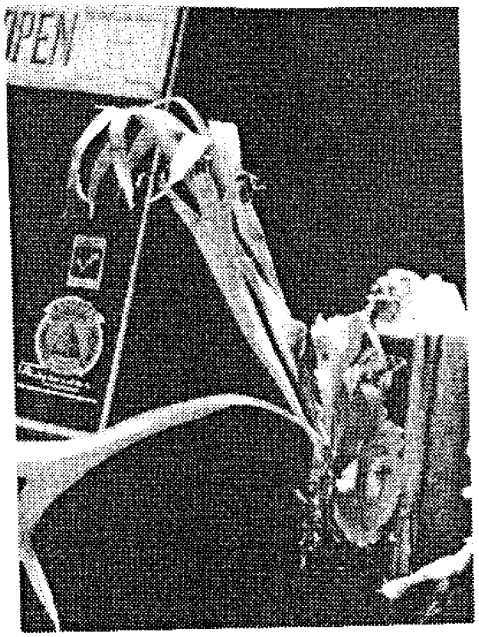
P. veitchii J. Hardson
David Miller photo



Hawaiian



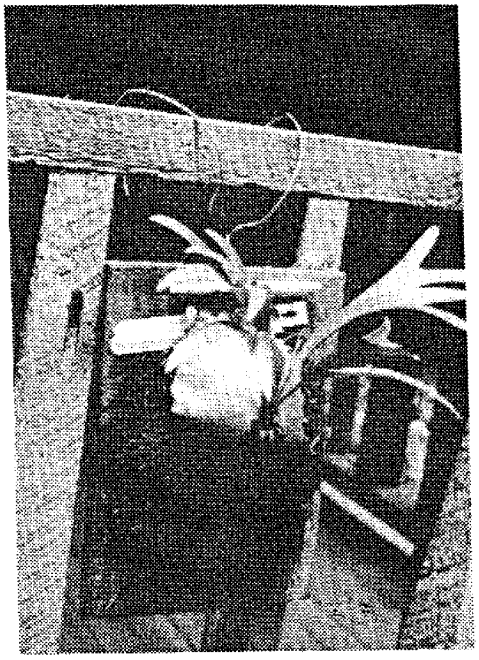
Hi Dee



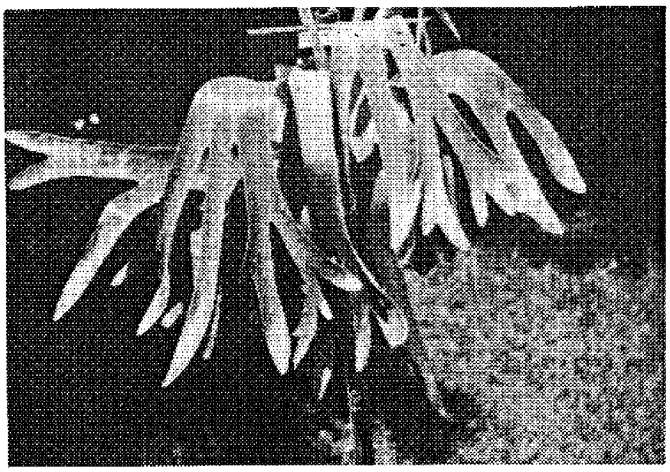
Hilo (Talnadge)

Horne's Delight (Horne)
volunteer sporeling

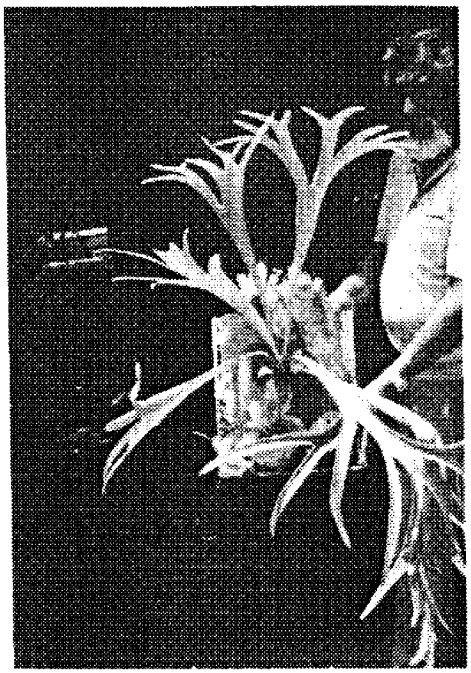
Hula Hands
(not Talnadge)



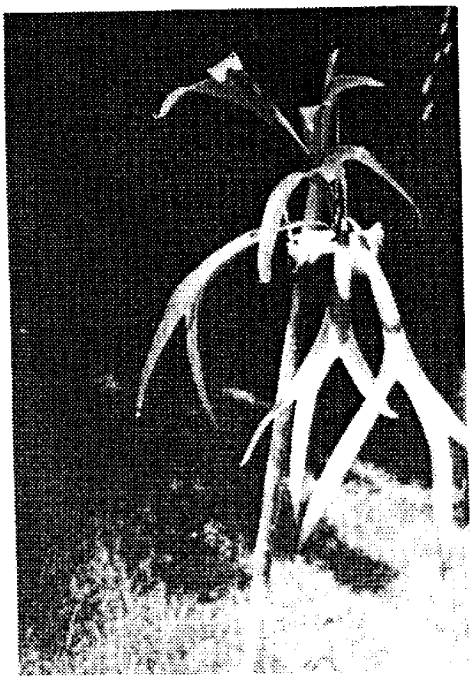
P. veitchii Java



Jamaica

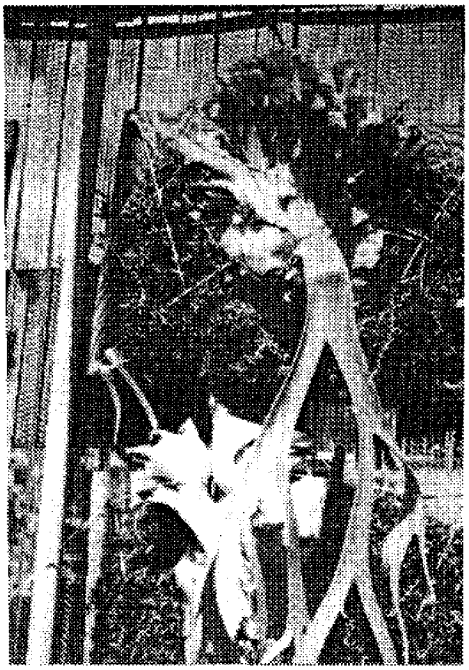


Jimmie



Hula Hands was brought to Talnadge, who wanted to name it after the person who brought it, but that person had already named it. There seem to be two or three forms of it.

Jo Jo (Talnadge)



Kingii

Lanciferum
(Ron Arant)

Lanciferum
same plant, one
year later

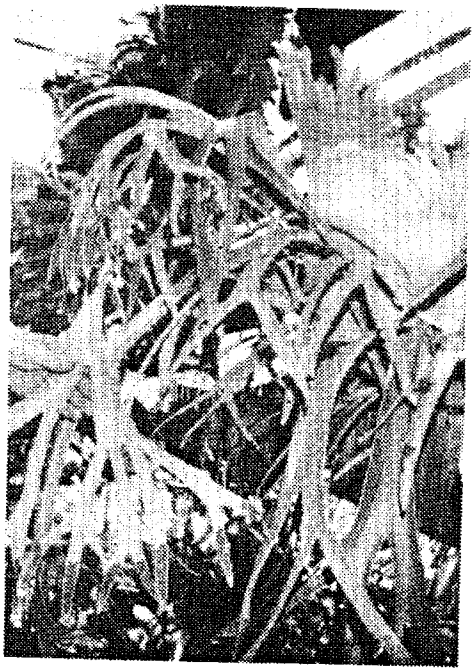
For Leatherman #3
see R2#3

La Reunion Island
(Oman) from there ?

Liberty

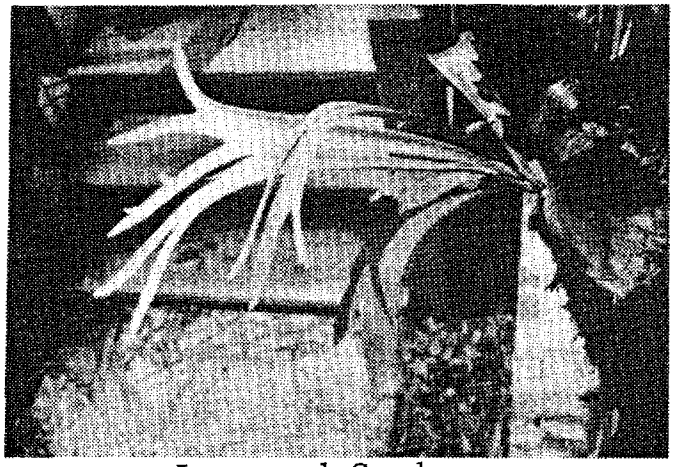
Longwood Gardens

For "Lemoinei" see pages 10, 25, 104, and 157.



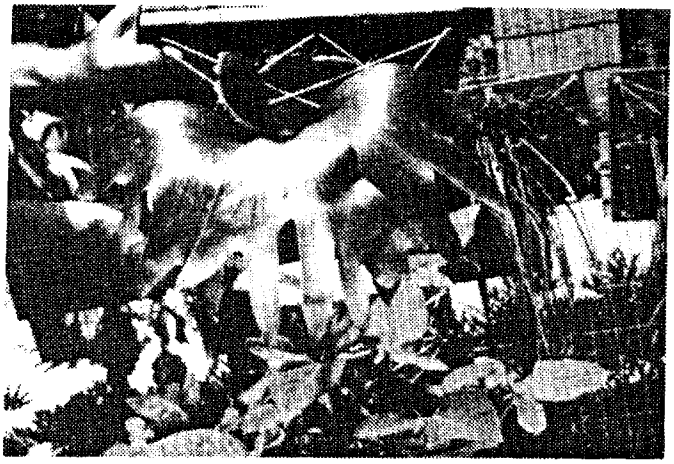
Longwood Gardens #2

From the late David Barry, who did both collecting and importing in the late 1960's and early 1970's. He ran California Jungle Gardens, in Los Angeles.

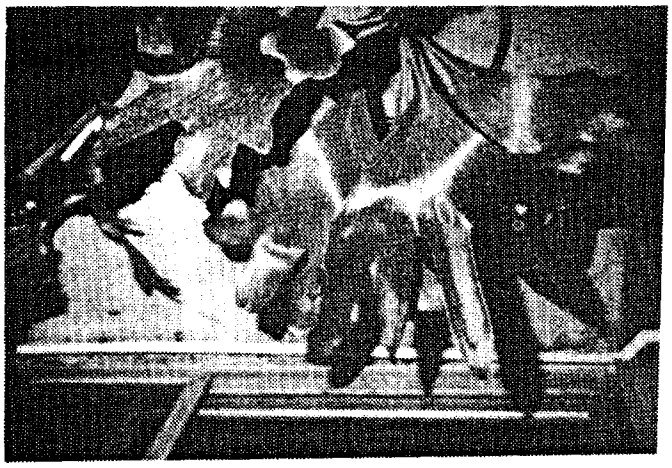


Longwood Gardens
Sporeling (Oman)

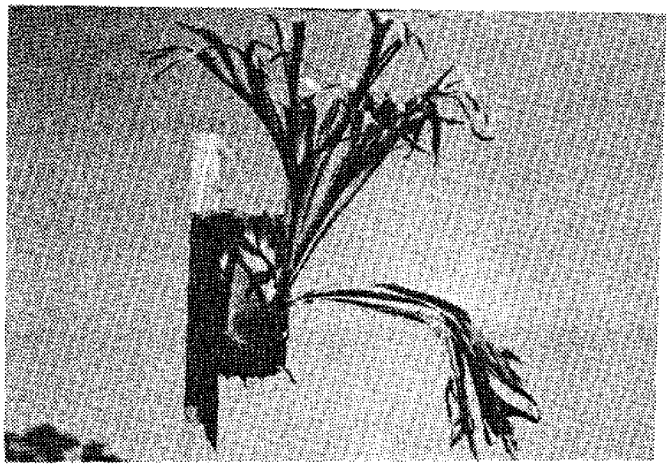
Longton (Talnadge)



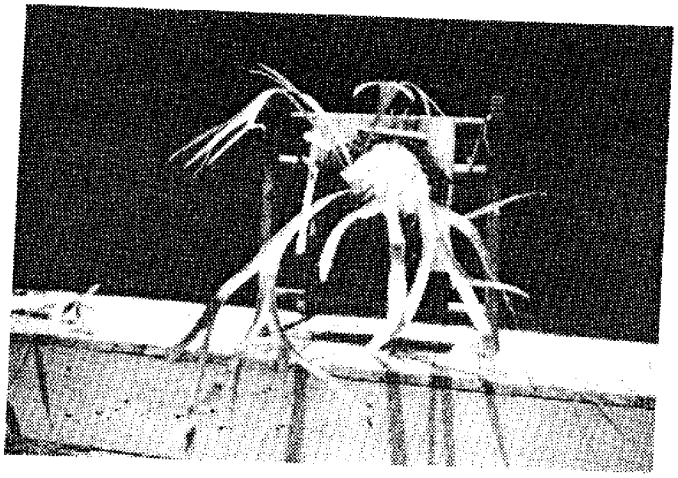
Lucky Strike (Talnadge)



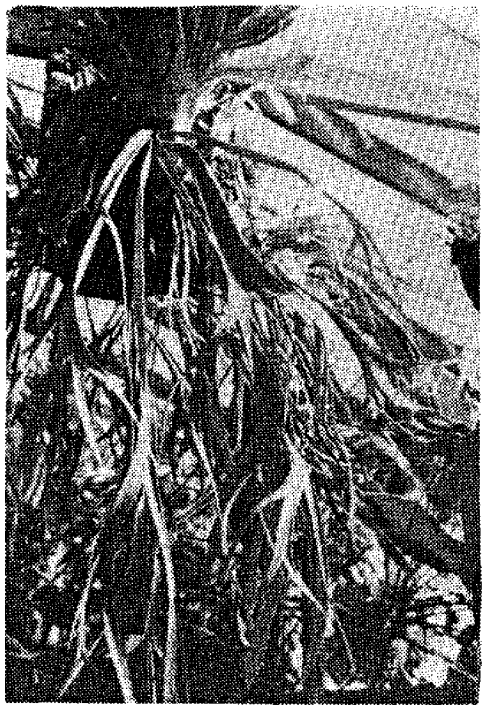
Magnificent (Mentelos)
Discovered by Tom Mentelos in sporelings from California.



P. bifurcatum cv. Majus



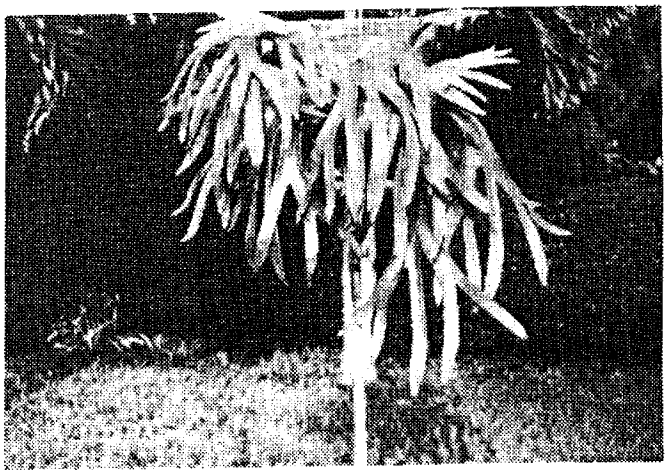
German Majus



P. willinckii cv. W. A. Manda
(plant collector in Pennsylvania)
David Miller photo

Maui (Talnadge)

Mauna Loa (Talnadge)

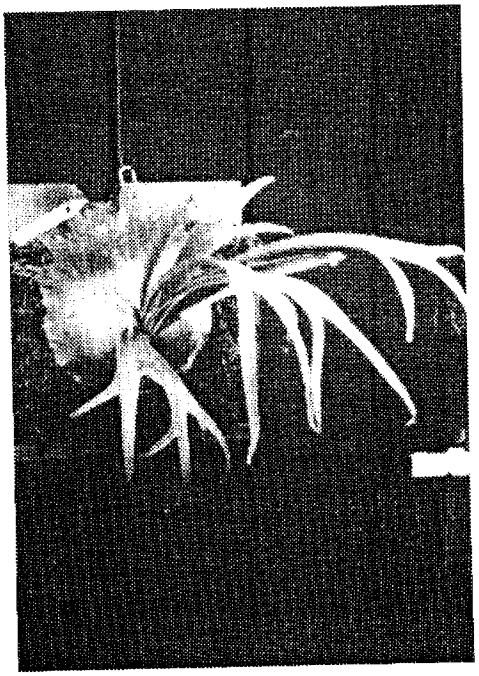


Mickey's #2

Volunteer sporeling for Mickey Carmichael, who has an orchid nursery in southern Florida.

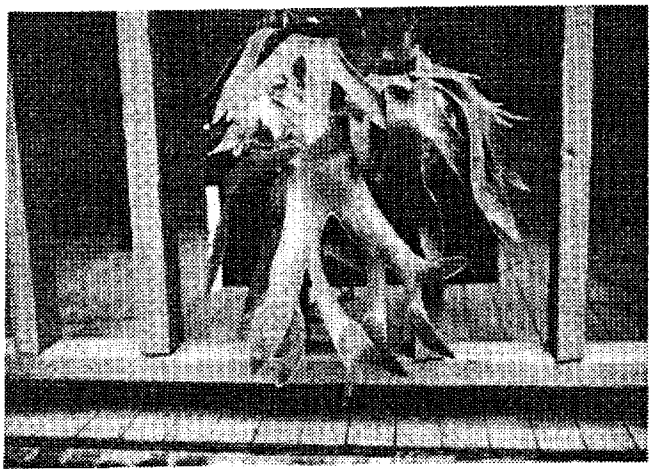
Minnie Bell (Hummel)

Hummel operated Hummel's Exotic Gardens, in Ingelwood, California, and made many bromeliad cultivars. "Minnie Bell" is his wife's name.



Minor (Ekstrand)

John Ekstrand, FerNut, Vista, California, sells ferns in shopping centers and plant shows.

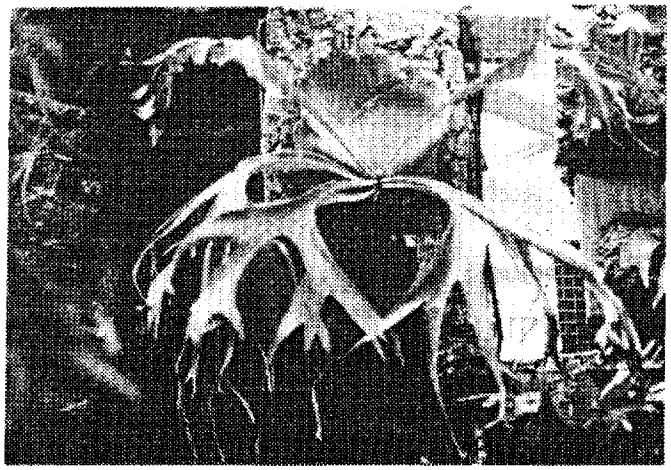


Missouri Botanical Garde (Oman)

Newbill

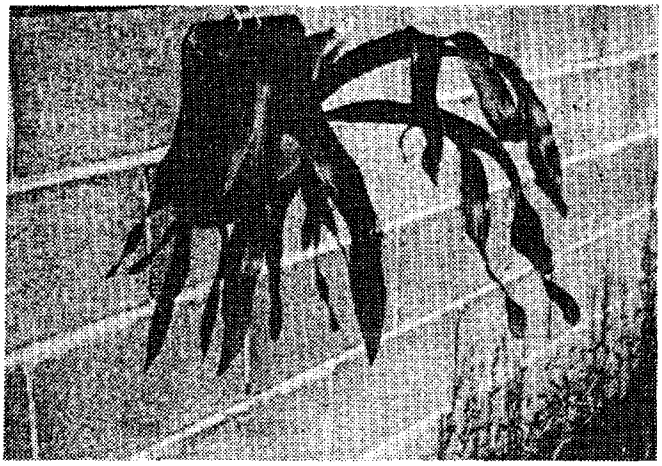
Imported *P. bifurcatum*, given to Jerry Horne by a late collector.

New Caledonia #2
David Miller photo

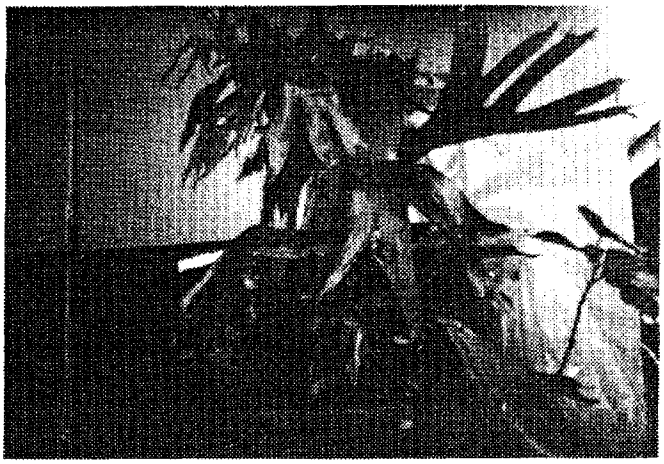


New *hillii*
David Miller photo

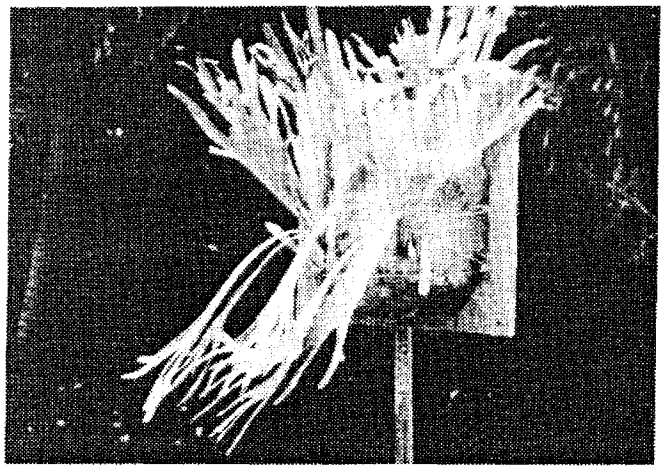
For "Netherlands" see pages 54, and 157.



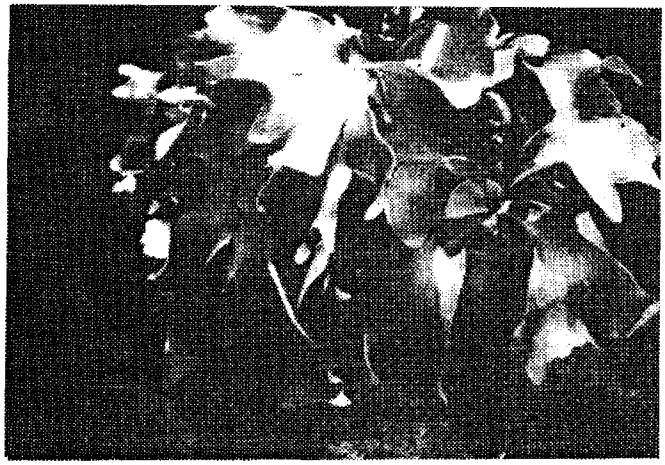
P. bifurcatum Normale



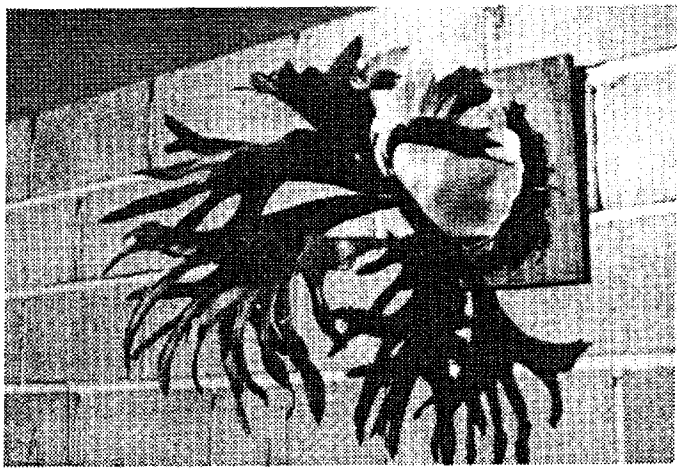
Nuevo Island



P. veitchii cv. Omanii

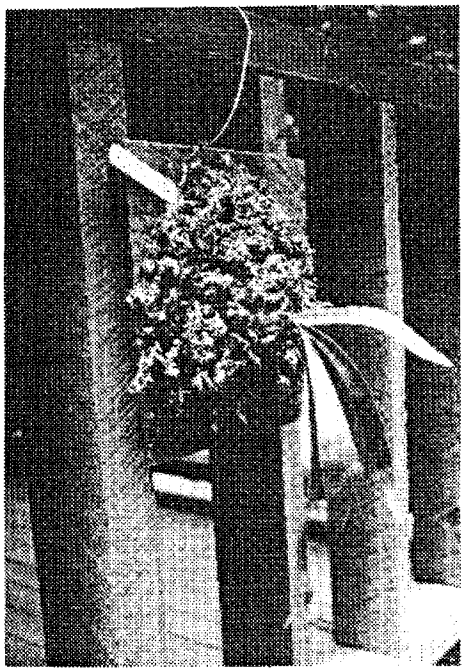


Panama
Grown in southern Florida
Pencil on one wide frond



Panama Grown in New Mexico

"Panama" started at a nursery on 20th Street, in Miami. Its owner, Mr. Bryant, saw the original plant on a palm tree in Panama and had it sent to his nursery, in about 1960. It has been called "The 20th Street *Platycerium.*" The nursery is no longer there.



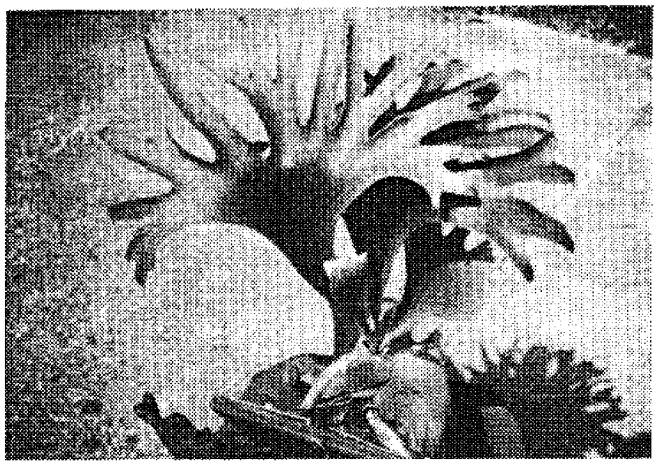
P. bifurcatum Patens

Payton Named by Joe, 1964,
for Wayne Payton.

Plath

P. willinckii cv. Paul

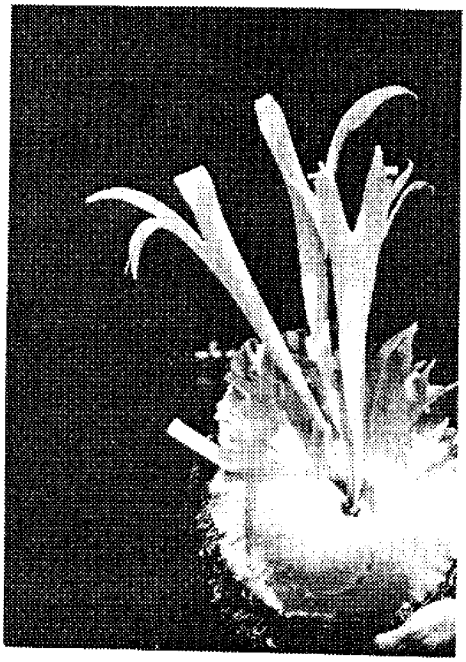
Pumila



Pumila "Kew Gardens"
(Talnadge)

Pumila "Kew Gardens" (Talnadge)

P. bifurcatum cv. Pygmaeum



P. willinckii
cv. Pygmaeum

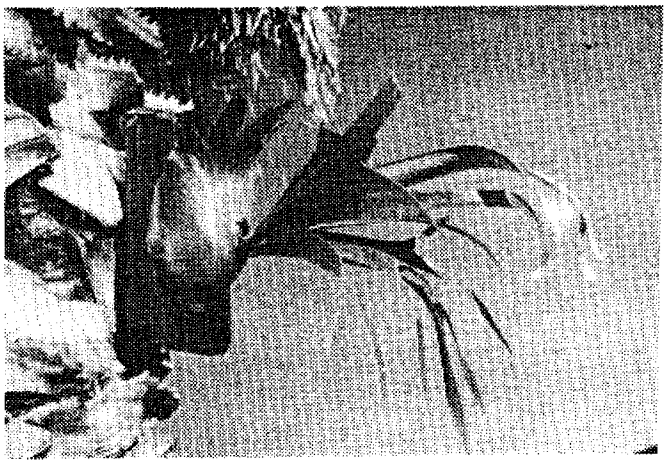
R2#3 or
Leatherman #3
Named by Bill Cook

For Roach's Tips
see Celebes

P. bifurcatum cv.
Roberts

Described in
Joe, 1964

Sumbawense, in oak tree



Sumbawense

P. sumbawense Christ, from Sumbawa pictured in Joe, 1964, is a synonyı of *P. willinckii*. This cultivar i: more like *P. bifurcatum*. It may b the same as Payton, on page 149.

Splendens (Talnadge)

South Seas (Talnadge)

P. willinckii cv. Silvery

Scofield

Named in Joe, 1964, for Glenn Scofield.

Santa Barbara *P. bifurcatum* grown outdoors there.

P. veitchii Sansome #2
David Miller photo

San Diego

Grown in San Diego as an outdoor plant for many years, it is still usually labeled "Alcicorne" in southern California. Mr. Cass used it in his crosses. Named "San Diego" by Joe, 1964. This identification has been verified.

T-One

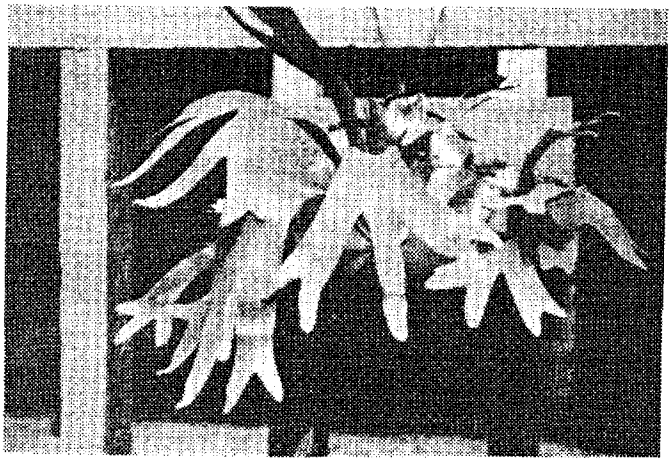
Talnadge

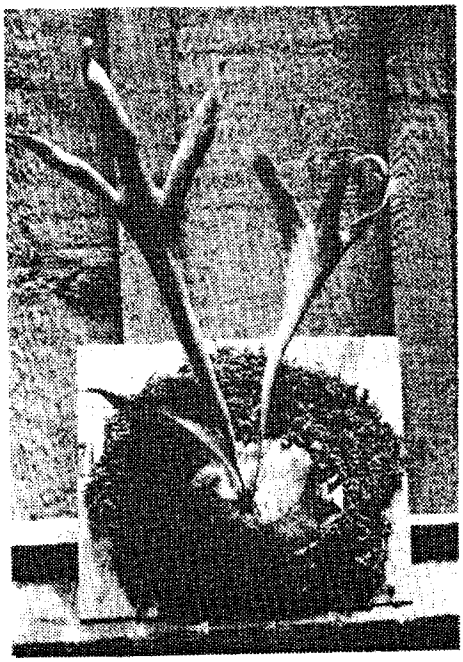
Talnadge

Tasmania

Theiban
David Miller photo
Named for John Theiban

Timor Island



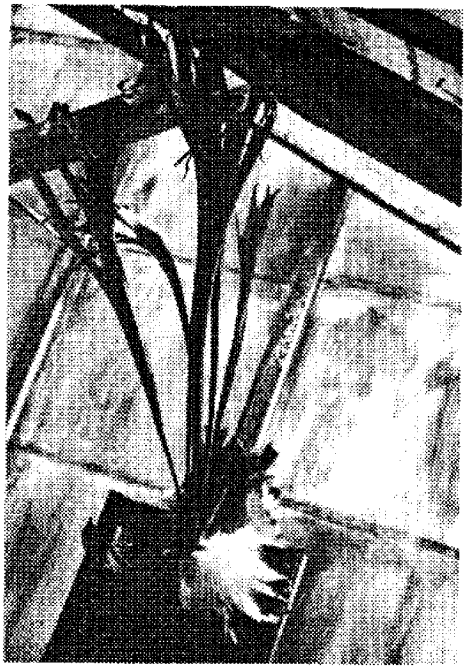


Turneri

Probably named for Marie Turner, friend of Sylvia Leatherman.

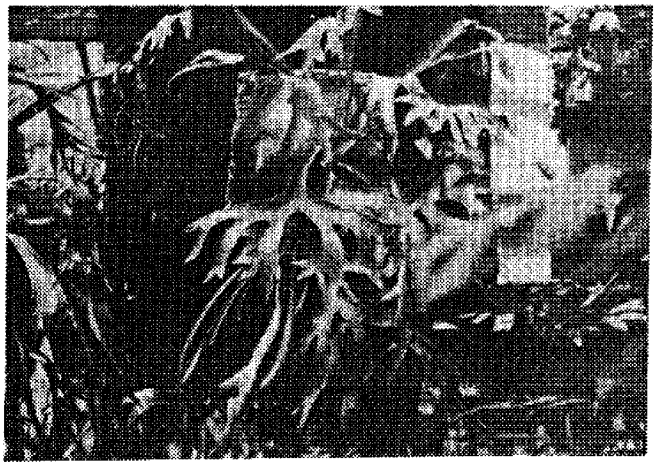
Tommet

Named for Tom Mentalos of Fantastic Gardens.



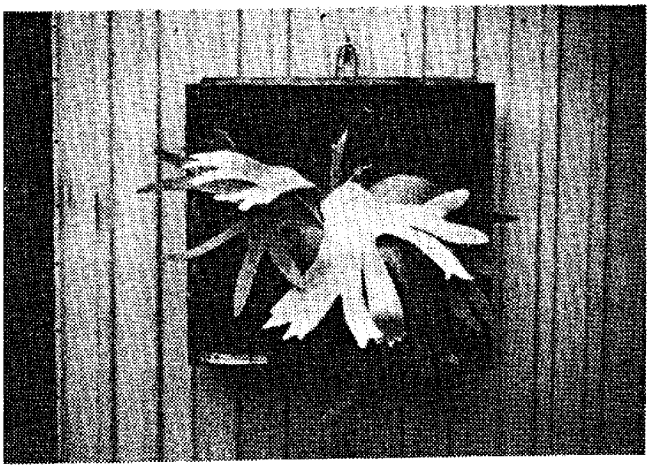
P. veitchii Variant
(Wendy Franks)

Walrusii



P. hillii cv. O. W. Wilson
David Miller photo

O. W. Wilson is a grower in California.



Paul Webber

Paul Webber

P. bifurcatum cv. Wood

Wrightii

P. bifurcatum cv.

Ziesenhenne

Described in Joe, 1964

Other cultivar notes:

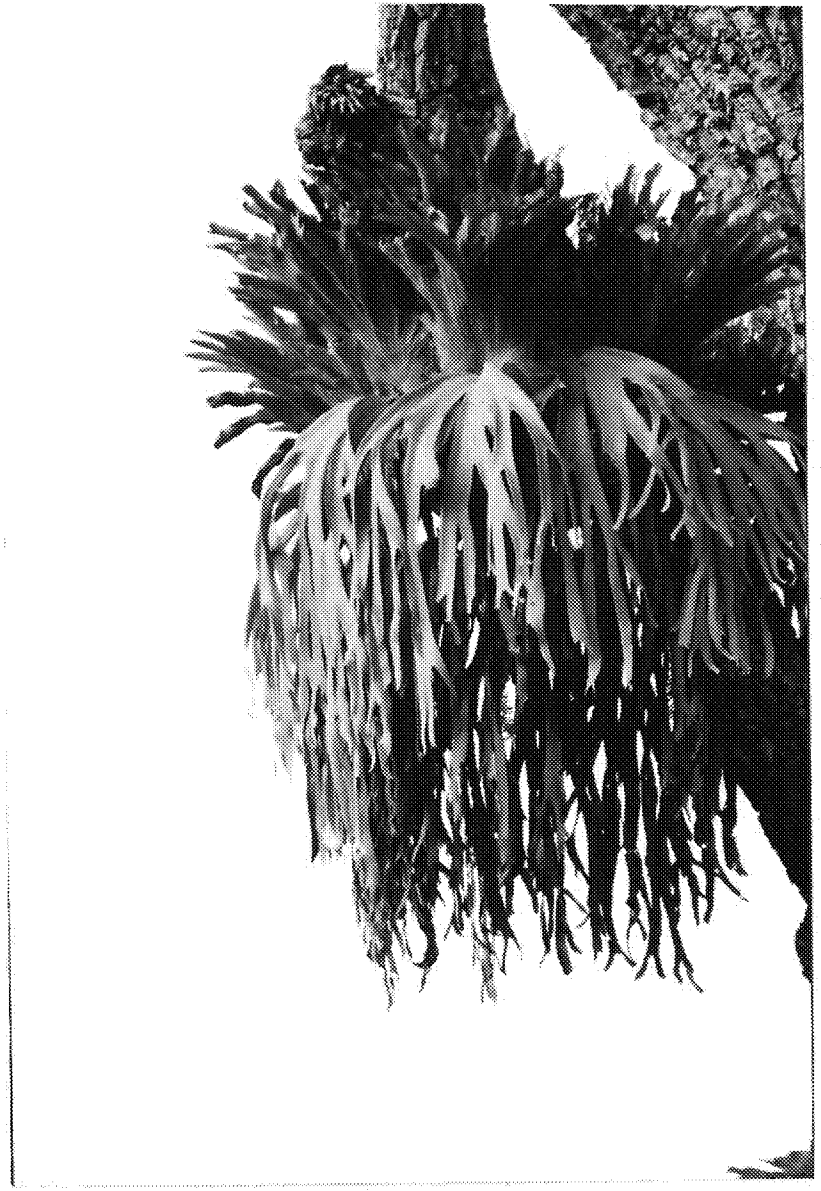
"Lemoinei" was first offered by V. Lemoine and Son Nursery, in Nancy, France, in 1924. They described it is a hybrid between *P. veitchii* and *P. willinckii*. Lecoufle* was very convinced that it was such a hybrid. Joe (Hoshizaki) in 1964 put it as a cultivar of *P. willinckii* and pictured one with very long, drooping fertile fronds. As shown on page 25, this author feels it only develops long drooping fertile fronds when grown in low light. When grown in high light, it is nearly identical to *P. veitchii*.

The name "Netherlands" was given by Joe (Hoshizaki) in 1964, replacing *P. alcicorne* var. *regina wilhelmine*, a name then used in the trade. The replacement was made to avoid confusion with *P. wilhelminae-reginae*, a species name, later changed to a synonym of *P. wandae*. "Netherlands" is the most commonly available *Platycerium* cultivar, tissue cultured in great quantities in southern California.

Cultivar names not pictured:

P. hillii cv. Australia White
P. veitchii cv. Blue
California Splendor
Campland
Dr. Carl's #3
The Duke (Talnadge)
Epstien
False ellisii
Fantasia
Fantastic
Ganter
Grana
Hastings
Hi-Ho
K. H. variety
Kailua Kona (Talnadge)
Mayi
Mickey's Rainbow
Mickey's #3
Mickey's #4
Ralph Hybrid
Sandra Islands
Seellsee (Behrends)
-pronounced "C" "L" "C"
Sister of Jo Jo (Talnadge)
Talnadge #4
Talnadge X
Tempo

*Marcel Lecoufle's nursery in Paris, France, was very active in early importation from Madagascar. Several dealers and hobbyists in this country have imported from Lecoufle. The nursery is now devoted almost entirely to orchids.



Platycerium andinum
habitat photos.

CHAPTER 6: Items

I. Hybrids

Although a few cultivars are supposed to be hybrids, the only documented case of crossing two species of *Platycerium* is the cross of *P. superbum* with *P. stemaria* by Tom Mentelos. In 1975 Barbara Joe Hoshizaki named the plant *Platycerium* x mentelosii cv. Fantastic Gardens. It was kept at Fantastic Gardens nursery in Miami until the summer of 1984 when the nursery closed. The plant was then donated to Fairchild Tropical Gardens, in Miami. Spore from it were grown by Robert Oman into a specimen which he plaqued in 1972. It formed its first fertile frond in 1982, and others in 1983. By 1983 the plant seemed to be reverting to the form of *P. superbum*. Spore from it have germinated, which should develop into the third generation. Other attempts to cross species are being made.

II. New Species

Reports of other species of *Platycerium* are not uncommon. Sightings are claimed in New Zealand, Equador, and even Honduras. A collector insists there is another species in the mountains of Madagascar. The only one of these with specimens currently in cultivation, other than 'Celebes,' is the *Platycerium* from the region of Mt. Lewis in remote northern Queensland, Australia. This plant was probably responsible for the early reports of *P. willinckii* in Australia.

III. Moss note

Sphagnum moss may cause some difficulties.

A. Water routes

A pathway may develop through the moss which allows water to pass through the moss without wetting the roots of the *Platycerium*. The solution is to press the moss tighter, and submerge the plant in water until no air bubbles surface.

Fig. 126 (above)

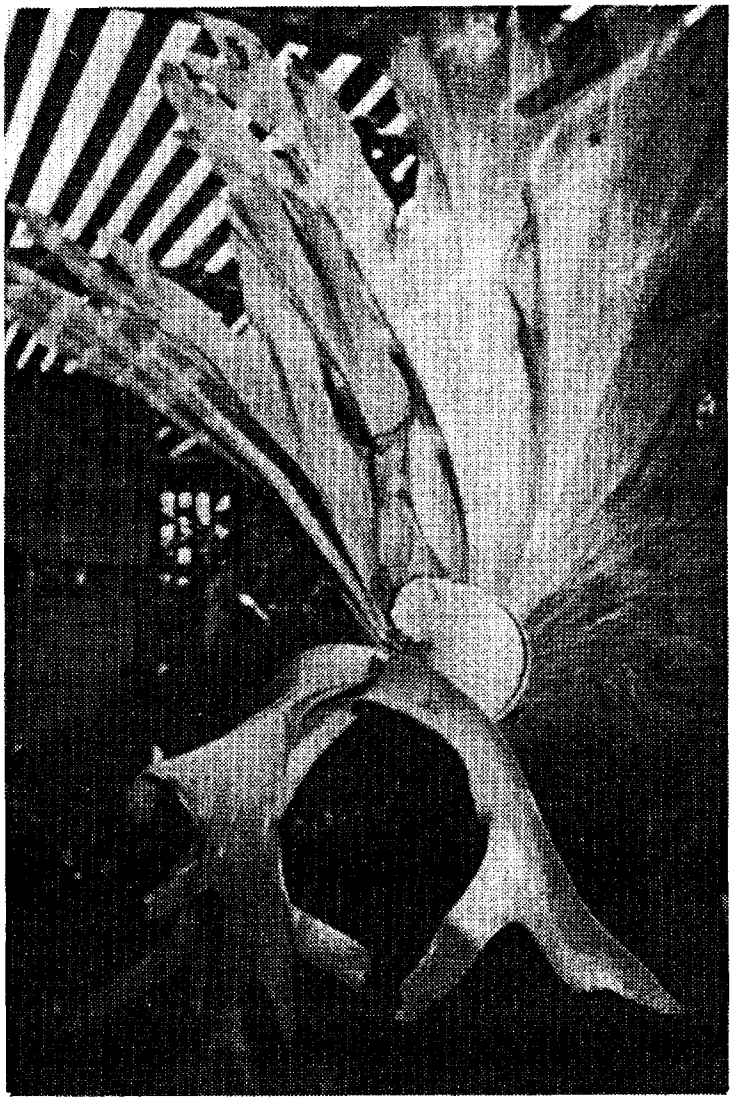
Two views of *P.* x mentelosii cv. Fantastic Gardens, taken at Fantastic Gardens in the summer of 1983. In the right view, part of the fertile frond is held over to show the spore patch. The plant was located and identified by Tom Henrichs and the author.

Fig. 127 (right)

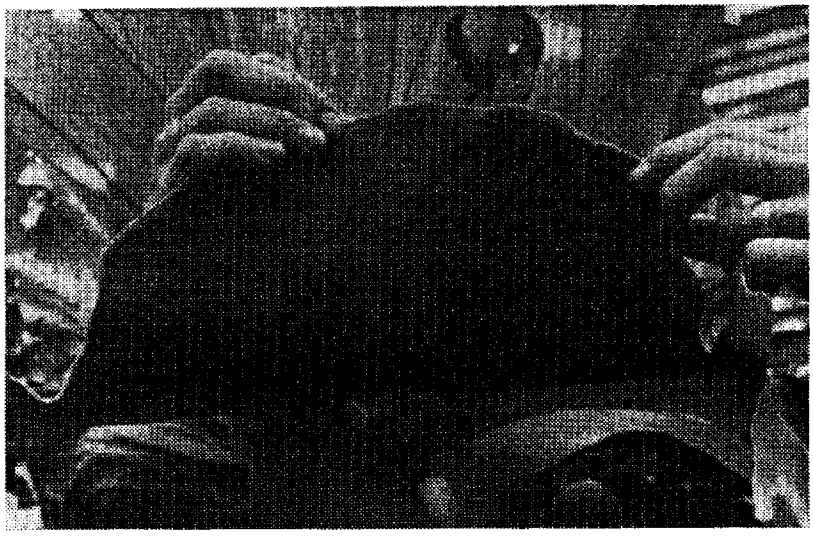
Second generation *P.* x mentelosii cv. Fantastic Gardens, grown by Robert Oman.

a. Summer 1982, first fertile fronds it ever formed.
b. Summer 1983, second fertile fronds, the spore patch of one has been cut away. By this time the plant had taken the general shape of *P. superbum.*
c. Brown spore patch, summer 1983.

a.



b.



c.

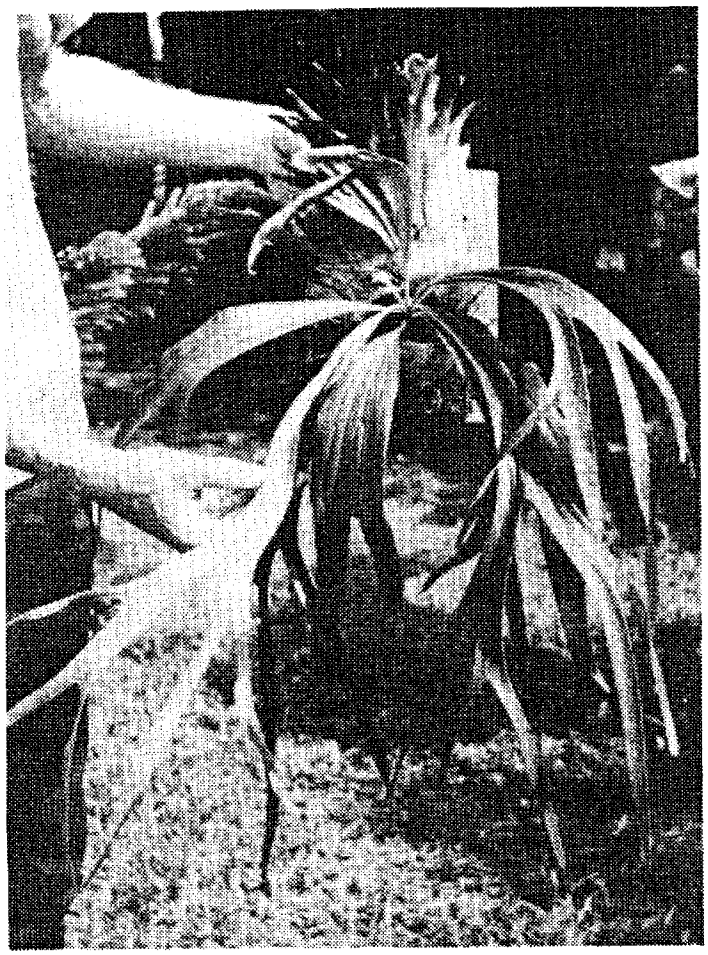


Fig. 128

A unique *Platycerium* collected in remote northern Queensland, Australia, in the area of Mt. Lewis.

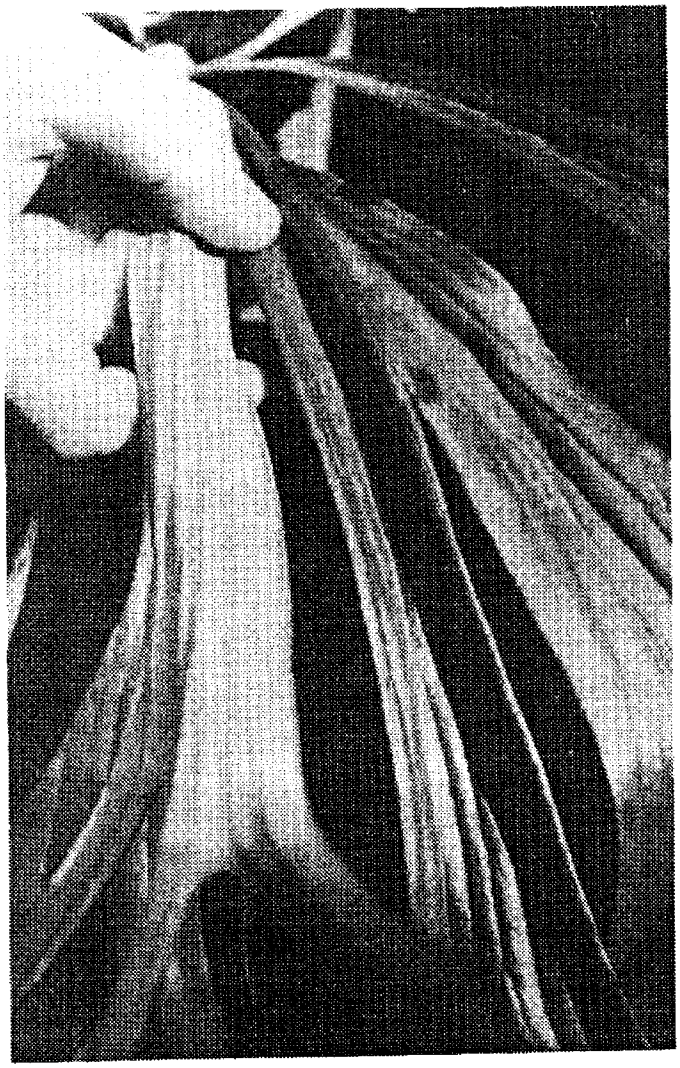


Fig. 129

Closer view of the upper and underside of the fertile frond of the Mt. Lewis *Platycerium* above.

B. Water rejection

When the moss becomes too dry, particularly if it is new, or has a surface coat of algae, it may reject water, causing it to trickle down The sides without entering. The treatment is also to submerge the Plant. Part of the algae coat may have to be removed.
Watering is simplified if a flat area, or even a depression, is made in the top of the moss above the plant.

IV Suppliers (U. S.) (Fern Societies web pages also have lists)

Plant suppliers (the author does not sell plants)

Glasshouse Works
Church Street, P.O. Box 97
Stewart, OH 45778-0097
740-662-2142 (information number)
http://www.glasshouseworks.com/fernpage.html

Charles Alford
1645 9th St S.W.
Vero Beach FL 32962-4314
561-770-9119 (e-mail for list)
chasalford@earthlink.net

Doug Eckel
2119 Victoria Dr.
Fullerton CA 92831
http://home.earthlink.net/~decho/

The Fern Factory (no address)
http://www.fernfactory.com

Wearne's Staghorn Nursery
Mulino OR 97042 (503-632-7086)
http://www.staghornnursery.com/

Madagascar Tropicals (very complete website)
24 E. Las Flores Dr.
Altadena CA 91001 (626-791-3600)
http://www.madagascartropicals.com/index.html

Rainforest Flora, Inc.
19121 Hawthorne Blvd.
Torrance CA 90503
http://www.rainforestflora.com/stags.htm

Materials Suppliers:

Carolina Biological Supply Co
Burlington NC 27515
http://www.carolina.com/

Orchids by Hausermann,
Box 363
Elmhurst IL 60106
http://www.orchidsbyhausermann.com

OFE International Orchid Suppliers $150 minimum shipping order
P. O. Box 7754, 10% extra on orders below $150
12100 S. W. 129th Ct. (Popular supplier, Long Fiber New Zealand Sphagnum Moss)
Miami FL 33186 407-293-2451
http://www.ofe-intl.com

(Page revised October 2008)

Tropical Plant Products
PO Box 161081
Orlando, FL 32854
305-253-7080
(Florida sphagnum moss)
http://tropicalplantproducts.com/

V-J Growers
1037 N. W. 4th Street,
Homestead, FL 33030
800-432-6925 .
http://www.vjgrowers.com
(Site does not take orders)
(Greenhouse supplies)

Fern Publications:
Updated 3/10/98
-Amounts in US Dollars for U.S. memberships-

American Fern Society
Dr. David Lellinger,
Membership Secretary
326 West St. NW
Vienna, Va. 22180-4151
$25/year Includes:
American Fern Journal
(research)
and Fiddlehead Forum
(hobbyist)
http://www.visuallink.net/fern/index.html

Tropical Fern & Exotic Plant Society, Inc.
6880 S. W. 75 Terrace
South Miami, FL 33143
(305) 666-0219 $15/year

Los Angeles International Fern Soc
Dave Fay
P.O. Box 90943
Pasadena CA 91109-0943
$20/year
LAIFS Journal,
Color covers, fine hobbyist publication.
http://www.smcdaniel.net/laifs/

The Fern Forum,
Southwestern Fern Society,
2105 Shadow Ridge Drive
Arlington, TX 76006
$15/year Mainly society news
http://web2.airmail.net/lhp/swfs/swfsgi.html

Rhizome Reporter
Stopped publication January, 1984

San Diego Fern Society
George Plaisted
6356 Delbarton Street
San Diego CA 92120 USA
$8/year
(Has publication, name not on website)
http://www.inetworld.net/sdfern/index.html

British Pteridological Society:
The Fern Gazette
Bulletin of the British Pteridological Society
c/o Miss A.M. Paul
The Natural History Museum
Cromwell Road
London SW7 5BD England £15.00
http://www.nhm.ac.uk/hosted_sites/bps/

Fern Societies:
Source: http://www.inetworld.net/sdfern/othersoc.htm
U. S. only listed here

Austin Cycad and Fern Society
John D. Young
5007 North Fresco
Austin, TX 78731

To join the discussion group FERNS, send:
SUBSCRIBE FERNS First_Name Last_Name to:
majordomo@hort.net

Corpus Christi Fern Society
P. Coleman
438 Claremont St.
Corpus Christi, TX 78412

Delaware Valley Fern and Wildflower Society
Clara W. Bondinell
1512 Franklin Lane
Wayne PA 19087

Hardy Fern Foundation (HFF)
Barbara Carman,
P.O. Box 166
Medina, WA, 98039-0166

International Tropical Fern Society
8720 South West 34th St.
Miami, FL 33165

Louisiana Fern Society
Mary Elliott
41038 S. Range Rd.
Ponchatoula, La. 70454

New York Fern Society
Dr. John Mickel
New York Botanical Garden
Bronx NY 10458

Memphis Fern Society
Chris Spindel
3985 South Galloway Drive
Memphis TN 38111-6841

San Francisco Fern Society
4726 Hilltop Dr.
El Sobrante, CA 94803

Tampa Bay Fern Club
Carl Strohmenger
PO Box 15578
Tampa Florida 33684-5578

THE AUSTIN FERN AND CYCAD SOCIETY
JOHN D. YOUNG (512) 454-9336 OR 229-3521
e-Mail jdyoung@austin.cc.tx.us

Platycerium andinum habitat photos.

Right, mature cluster, on quinilla tree, Jan. 1996. Note overall ring shape.

Below: Dead ring on quinilla tree, from video. April 1 1999. Both near Tarapoto, San Martin, Peru.

Sources of books:

LAIFS Bookstore,
6561 Melbourne Drive,
Huntington Beach, California 92647

Rainbow Gardens and Bookstore,
1444 E. Taylor Street,
Vista, California 92084

Desert Biological Publications
Box 722,
Mena, Arkansas 71953

- - - - - - - -

Since this book was published many things have happened. Robert Oman passed away in March of 1988. Eugenio Pingatore, who made the drawing on page 43, is also gone.

In 1987 a new species, *Platycerium bilobum*, was described.

Ralph Hughes, following the classification of Hennipman and Roos, described the Mt. Lewis plant as *Platycerium bifurcatum* ssp. *willinckii* var "venosa" in LAIFS Journal, June 1989.

Later in the American Fern Journal, Vol. 80 No.2, 1990 Hoshizaki & Price described *Platycerium* x elemaria 'Sanchez,' a cross between *Platycerium elephantotus* and *Platycerium stemaria*. It was found in the collection of Ernie Sanchez, and named for him. They agreed that *Platycerium angolense* shound be called *Platycerium elephantotus* and that *Platycerium vassei* should be called *Platycerium alcicorne*. They said *Platycerium bilobum* was not different from *Platycerium coronarium* which means there now is no *Platycerium bilobum*. They also were very critical of the work of Hennipman and Roos.

In late 1995 and early 1996 I traveled in Peru with Lee Moore, studying the habitat of *Platycerium andinum*. My report was in LAIFS Journal, Feb. 1997.

Jerry Horne sells a *Platycerium angolense* cv 'Roy' named for me. The original plant came from Helen Shortt, wife of Bill Shortt. I believe it is the same as *Platycerium* x elemaria 'Sanchez,' which is not in the trade. Ernie Sanchez could have gotten his original plant from Helen Shortt since the two did trade plants.

The stock plant of cv. Gigi was also Helen Shortt's. She gave one pup to me, which died. Later, when she was disposing of her collection, she gave me the stock plant. I sent it to Jerry Horne for cultivation. He kept it over 5 years but it never pupped. Eventually it died.

April 13, 1997

Publishing Information:

Spacing of the text was done in the Editor of U. C. S. D. Pascal System II.0. There are no hyphenated words in this book. Type is Prestige Elite, and light Itallic. Photo screens are 85 lines/inch, except the back cover which is 130 lines/inch. All the author's photos were screened from direct positive Type R prints from 135 mm Kodachorme 25 slides.

Photo screens by:

ABC Printing, Las Cruces, New Mexico
Hynes Advertising, Las Cruces, New Mexico
Del Valle Printing, and Graphisc,
Las Cruces, New Mexico

Covers by Pony Express Printing, Mesa Arkansas

Copying, collating and binding by the author

Conclusion

If this book is your first introduction to the genus *Platycerium*, I would suggest you subscribe to hobbyist periodicals, and look for a fern society in your area. For an introduction to staghorn ferns, contact plant suppliers, and try some of the standard cultivars, such as Bloomei, Florida, Hula Hands, Netherlands, Majus, Pumila, Lemoinei, Panama, Sumbawense, San Diego, and Ziesenhenne. Then try species, considering the listing on page 115. I wish you all the success in the world. Welcome to a fascinating hobby.

I hope this book is a service to the *Platycerium* hobbyist. What I have written here is not all that is known now about this genus, plus, we have much more to discover about *Platycerium*.

For additional reading:

Hoshizaki, Barbara Joe, 1978, Staghorn Ferns Today and Tomorrow, LAIFS Journal, Vol. 5(3) 72-5

La asociación Bosque del futuro ojos de agua

Construye local utilizando materiales de la zona

La asociación de protección y conservación ecológica "El bosque del futuro ojos de agua" de la provincia de Picota viene trabajando en la construcción de un local propio en la cual están utilizando materiales de la zona, como maderas rollizas y hojas de palmas.

El mencionado local contará con un auditorio y una oficina administrativa, la misma que servirá a la colectividad de Pucacaca sobre todo a las organizaciones sociales de base, quienes podrán desarrollar diversas actividades como talleres, capacitaciones, en un local fresco y ventilado.

Integrantes de la asociación en pleno trabajo en la construcción del local institucional.

El anhelado local propio viene siendo financiado por el biólogo Mr. ROY VAIL compromiso que asume a raíz de un trabajo conjunto realizado entre la asociación y el profesional norteamericano, quien ha visto la necesidad de esta asociación de un lugar adecuado donde puedan desarrollar sus actividades de investigación.

Los integrantes de la asociación de conservación y protección "Bosques del Futuro Ojos de Agua", está invitando a la población Sanmartinense a visitar esta zona protegida, de Pucacaca distrito de la provincia de Picota, que es uno de los parajes turísticos promisorios de la región, por que posee una diversidad biológica por ser considerada como bosque seco tropical del Huallaga central como un hábitat muy poco estudiado por la ciencia y al mismo tiempo despierta el interés de muchos visitantes por conocerlo.

Pág.02 San Martín Diario AHORA

"Corona de los Ángeles":

En Picota existe el helecho grande de Sudamérica

Mr. Roy Vail, Biólogo Norteamericano, en su última visita a Bosques del Futuro de Pucacaca, en el recuadro la Corona de los Ángeles.

El helecho más grande de Sudamérica llamado "Corona de los Ángeles" cuyo nombre científico es "Platycerium Andinum" tiene como su hábitat natural los Quinillales del Huallaga Central generalmente en la provincia de Picota, está en peligro de extinción.

Estas afirmaciones las hizo el biólogo Mr. Roy Vail, de Mena Arkansas EE.UU. profesional que estudia por más de 30 años este helecho maravilloso, fue en su última visita que realizó a la localidad de Pucacaca, específicamente a los bosques protegidos "Ojos de Agua", del mencionado distrito.

A su arribo a la localidad de Pucacaca, provincia de Picota, el Biólogo norteamericano reunido con los integrantes de la asociación el "Bosque del futuro ojos de agua", firmaron un acuerdo para realizar el cuidado y un manejo serio de esta especie única en el Perú. Dijo que su conservación podría ser de atracción para los turistas ecológicos.

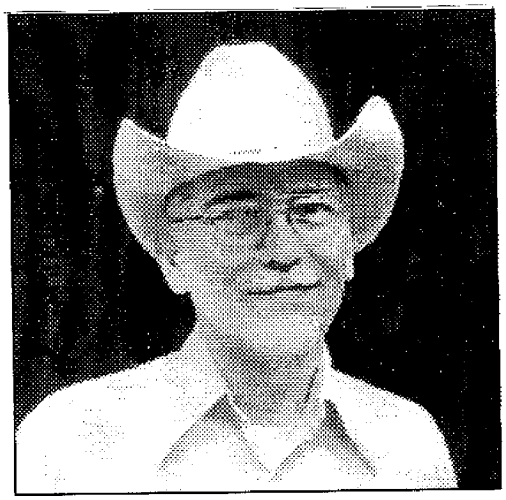
La organización civil "Bosque del futuro ojos de agua", de Pucacaca posee un área boscosa de 2,413 hectáreas de bosques primarios en completo estado de conservación en la cual la organización viene trabajando en su conservación.

Al visitar este hermoso lugar situado en Pucacaca se puede apreciar especies únicas en su género como reptiles, aves y árboles que solo crecen en bosques secos tropicales, cactus en un excelente estado, por lo que es importante el apoyo profesional que recibirán del Biólogo Mr. Roy Vail.

NOTE: (January 23, 2010) These two articles are from a newspaper in the state of San Martin, Peru, in either December 2009 or January 2010, I'm not sure which. I went to Peru during the first week of November, 2009. All the video I took was high definition. Watch for it to become available. For more information about that trip go to the websites, http://www.royvail.com/ and http://www.pucacacaperuforest.com/ I MUST say this. Encourage your children, grandchildren, to take a foreign language. Foreign languages are living things. Even an old man (72) living in a small (less than 6,000), remote town in western Arkansas, can make a difference in the world because he took a foreign language, in my case Spanish. RV

Index
(Italic indicates page with photo or drawing)

About the Author



Roy Vail has been a biology teacher at Las Cruces High School, in Las Cruces, New Mexico since 1962. He has a BA from Earlham College, and a MAT from New Mexico State University.

While at Las Cruces High School he has taught courses in Genetics, Cell Biology, Marine Biology, Evolution, Botany, and Human Biology. He has been nominated for Outstanding Biology Teacher for New Mexico, for 1983-84. Every year since 1973 he has led student camping field trips to Puerto Penasco, Sonora, Mexico, for the study of intertidal marine biology. He has also taken students to Sea World, and the Grand Canyon.

While in high school in Richmond, Indiana, he wrote many hobbyist articles on cacti. In college he continued this writing, and took a six month foreign study program in Mexico. Other writings include hobbyist articles on tropical fish, an article on the use of computers in teaching biology, which included a model of evolution by natural selection, and several articles in LAIFS Journal. Some of his color photos of marine organisms were used by The University of Arizona Press in "A Handbook to the Common Intertidal Invertebrates of the Gulf of California" by Richard C. Brusca. This is his first book.

Note, added March 1998 (Revised December 3, 2002)

In the late 1980's my hobby greenhouse near Dona Ana, New Mexico, burned and my ***Platycerium*** collection was lost. In the spring of 1990, after a divorce, I retired from teaching and moved to Arkansas. In 1992 I remarried and now live in Mena, Arkansas, in the Ouachita (Watch-a-taw) Mountains, 100 miles north of Texarkana. I have a ***Platycerium*** collection, but it is not nearly as big as what I had in New Mexico. I have made two trips to Australia, and several to Peru. I wrote another book, "Mena and the "Queen Wilhelmina Inn, a brief History," which I published in 1995. My main other interests are photography and little theatre.

Note, added November 2000, (Revised December 3, 2002)

As the photos on pages 158 and 164B show, I have become heavily involved in studying and preserving the habitat of ***Platycerium andinum*** in Peru. I consider the photos on page 158 to be the finest photos ever published of ***Platycerium andinum***. They were taken from a dirt public road near Picota, San Martin, Peru. (The next note tells what happened to the area) The photo at the top of Page 196-B is more typical because ***Platycerium andinum*** is an understory plant. Articles about this effort have been published in the LAIFS Fern Journal, the latest being in Volume 27, Number 5, August 2000. There was another in April 2000. The area is tropical dry forest, a rare ecosystem.

The effort began in 1996, in Tarapoto (Tara-PO-toe) San Martin, Peru, which is the lectotype locality for ***Platycerium andinum***. Earlier I had been part of a group lead by Mr. Lee Moore, of Miami. We found that not only was ***Platycerium andinum*** becoming rare in that area, few citizens knew what it was. I made several trips to Tarapoto, where I spoke to many mayors, newspapers, radio stations, gave out color post cards, and a booklet about ***Platycerium andinum*** and why it should be saved. From home I mailed a copy of my booklet addressed only to the Biology Department of the University of San Martin, in Tarapoto, not knowing what to expect. To my amazement, I received an e-mail, in English, from a young instructor, Marco Leon, who had even read Platycerium Hobbyist's Handbook.

Eventually a magnificent area was located, closer to Picota (Pea-CO-ta) than Tarapoto. A very active student group formed at a teacher's college in Picota. They named themselves the "Chullachaqui" (chew-ya-CHA-key) after a small spirit, like a leprechaun that lives in the forest. Legend says a chullachaqui has one foot larger than the other. If you are lost in the forest, and intend to do the forest harm, a chullachaqui will take the shape of a friend and lead you deeper and deeper into the forest, getting you more and more lost. So, when you are trying to find your way out of a forest, you should watch your own feet to be sure they remain the same size, so you will know you are **not** following a chullachaqui.

One of the most rewarding letters I ever received from Peru was from the president of the Chullachaqui, in less than perfect English. Part of it said, "Thank you for your trust with us, the dream that you have I know it benefits all the world and we never going to fail your trust."

In the December 1998 LAIFS Fern Journal, Volume 26, Number 1, Barbara Joe Hoshizaki described ***Platycerium*** 'Home's Surprise,' which is probably a cross between ***Platycerium madagascariense*** and the mainland form of ***Platycerium alcicorne***. It is a nice plant, far easier to grow than ***Platycerium madagascariense***.

- -

Note, added June 29, 2001 (revised December 3, 2002)

The "Microcuencia del Bombonjillo," ecological preserve in the district of San Martin, Peru, was dedicated June 8, 2001. It is a 12,900-hectare (49.8 square mile) Municipal preserve of the cities of Picota and Bellavista. The Chullachaqui changed its name to "Area de Protecction Municipal El Quinillal." Marco Leon is leading the effort in Peru. He believes that to be truly protected the preserve must become Federal, which will require a biological inventory and an economic impact study. As far as I can find, this is the ONLY preserve on Earth made to save the habitat of a fern.

The work in Peru brought me in contact with Ricardo Fernandez, a botanist from Lima. We have submitted a paper, to The American Fern Journal, which extends the range of ***Platycerium andinum*** and comments on its biology. Recent reports from Bolivia need to be added.

The Volume 28, Number 1, Jan-Feb. 2001 issue of the Fiddlehead forum (ISSN 0733-8015) has my article "The Vail Theory" which suggests that the shape of the top halves of the shield fronds in ***Platycerium*** tells a lot about the environment where the species lives, and therefore how to care for it. Species like ***Platycerium bifurcatum*** that are open on the top are adapted to collecting and conserving water from above. They are native to tropical dry forests and can tolerate some dry periods. Species **like** ***Platycerium hillii, Platycerium madagascarense*** and ***Platycerium ridleyi,*** that are closed on the top, are not adapted to collecting water and therefore must be native to rain forests and can not be expected to tolerate dry periods.

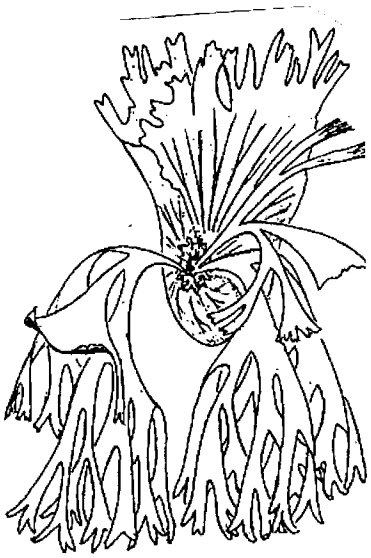
The article also suggests there are three forms of ***Platycerium*** clusters, the ball, the basket and the ring. Pup forming species from rain forests form balls, closed at the top. Examples: ***Platycerium hillii, Platycerium ellisii***, and ***Platycerium madagascarense***. Pup forming species from tropical dry forests form either baskets or rings. ***Platycerium bifurcatum*** forms baskets, a mass of plants, open at the top, which functions like a water-collecting vessel. Cutting a plant from its bottom may cause the cluster's water to run out. The cluster patches its leaks by forming pups in wet spots, which explains why pups form under my watering spitters.

Giant species such as ***Platycerium andinum, Platycerium coronarium, Platycerium elephantotus***, and ***Platycerium willinckii*** tend to form rings rather than baskets, possibly because their large individuals would shade out pups that appeared underneath. I have received no bad comments about this article.

The October 2000 issue of LAIFS Journal, Volume 26, Number 7, has a short article of mine with photos that show how the veins in the dead shields of ***Platycerium elephantotus*** curve forward when they are dry, but quickly become straight when they are wet. This would cause the top of a plant to be open when dry, but to close as it became wet.

I am also becoming convinced that something Helen Shortt told me years ago is very true. Large species like ***Platycerium andinum***, and ***Platycerium elephantotus***, depend on leaves and trash falling from above to fill the spaces between their shields. Since this does not happen in collections, it is important to pack the spaces between the shields with sphagnum moss, but not peat moss because it holds too much moisture. Without this, over time, the roots, which grow from the bud, will have nothing to grow into and the plant will die.

Barbara Joe Hoshizaki and Robin C. Moran have published a revised edition of "Fern Grower's Manuel." The 504-page book from Timber Press, ISBN No. 0-88192-945-4, premiered at a special book signing at Fairchild Tropical Garden in Miami in April 2001. They too use the names ***Platycerium alcicorne*** and ***Platycerium elephantotus*** in place of ***Platycerium vassei*** and ***Platycerium angolense***.



Sadly, Jerry Horne has completely retired from the nursery business. Charles Alford is now the main mail order supplier of ***Platycerium***. He prefers to grow even ***Platycerium elephantotus*** from spore, which he sows without separating the spores from the chaff. The very unique plant he produced appeared to be a cross between ***Platycerium ridleyi*** and ***Platycerium wandae*** (!!) DNA studies never became available, however Barbara Joe Hoshizaki concluded from detailed observations that it was mutation of Platycerium wandae. In her paper, published in Fiddlehead forum, Bulletin of the American Fern Society, Volume 28, Number 3, May-July 2001 she named it Platycerium 'Charles Alford.' The drawing at the right is from her paper.

Miles Goodman of San Diego, who raises many ***Platycerium*** from spore and distributes them, and my book, to nurseries in southern California, told me that Steve Talnadge died at age 89 in mid June 2001. After he sold his home in Chula Vista he moved to a trailer in Imperial Beach, California. Miles commented, "Steve was best known for reaching many collectors of staghorns and selling and generating interest in ***Platycerium***. He was well known in Southern California and sold thousands of plants at the annual DelMar County Fair. By naming many cultivars, he helped popularize the field and formed the foundation of many collections. Until this time, most plants were identified by number or, by association with the person that grew the plants." His daughter-in-law Velma Talnadge grew and sold ***Platycerium*** for many years in Spring Valley, California, but no longer does.

Many web sites relate to ***Platycerium***. My story is at:

http://home.earthlink.net/~vailroy/index.html

(Which might be removed any day now since I no longer use Earthlink)

Since non-commercial websites are free in Geocities, and their template is easy to use, I have posted several.

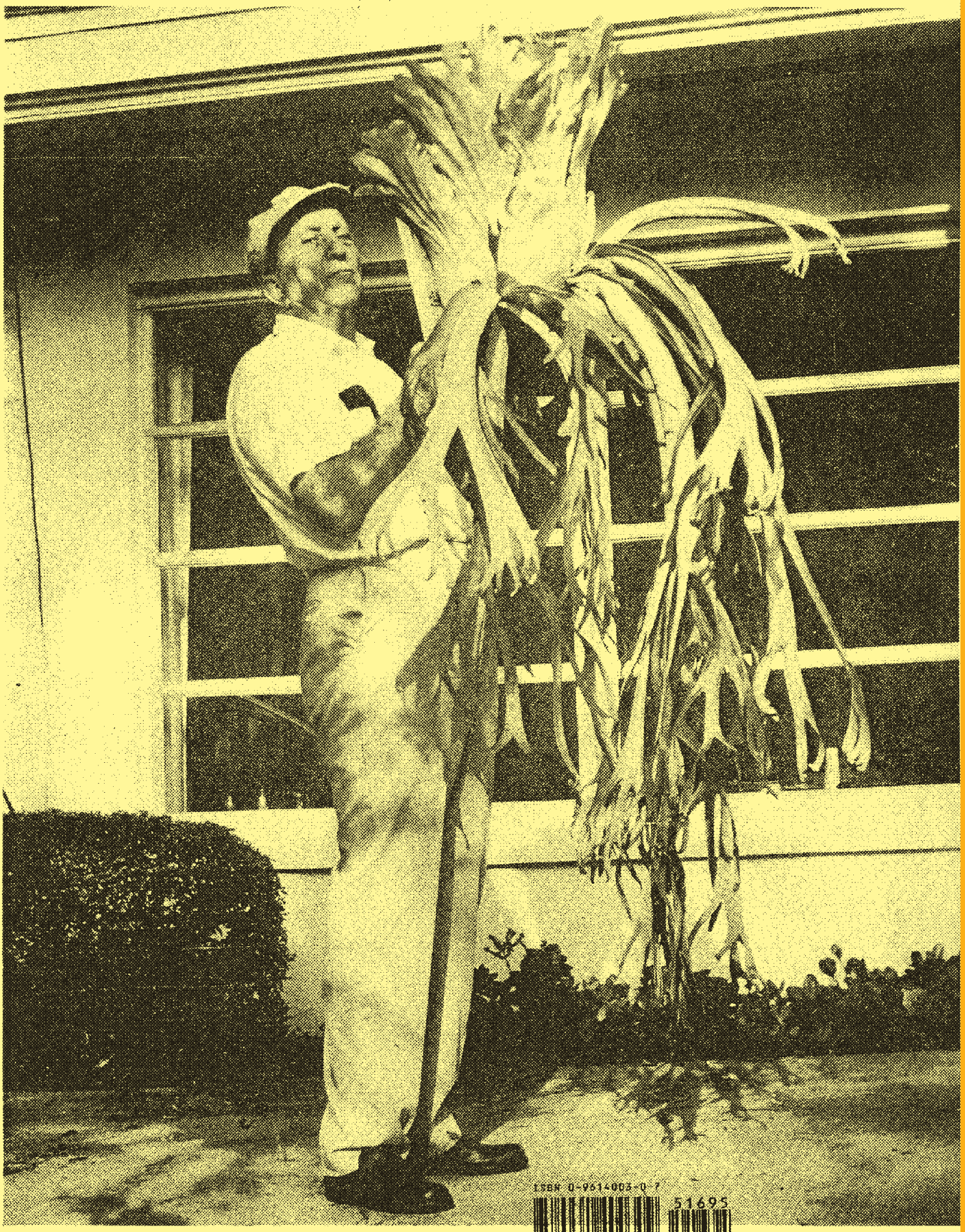
http://www.geocities.com/vailroy/Platycerium.html (A place I post pictures)
http://www.geocities.com/tarapoto_peru/ecology.html (Story of my efforts in Peru)
http://www.geocities.com/vailroy/Quinillal.html (Peru News)
http://www.geocities.com/vailroy/QuinillalDedication.html (Peru News)
http://www.platycerium.co.za/ (Our ***Platycerium*** site)

If you e-mail me at vailroy@hotmail.com I will be glad to send you a more complete URL list.

I make these books in sets of 25. After considerable thought, I invested in a newer copy machine—my third, 1000 new covers, and a bar code. It would be a milestone to keep this book in print for 20 years, which will be October 2004. Perhaps by then I can produce a revised CD-R version, which can have color pictures and be **far** easier to produce. The function of this book has always been to promote ***Platycerium***. Since 1984 its price has only increased once.

Roy Vail, Mena, Arkansas

PLATYCERIUM HILLII



ISBN 0-9614003-0-7
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ISBN: 0-9614003-0-7