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About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

357-2545

3 de marzo de 1981

Dr. Angel Cabrera
Museo de la Plata
La Plata, Argentina

Estimado Dr. Cabrera:

Le doy las gracias por los libros enviados recientemente.
Los mismos son una gran aportacion para mi biblioteca.

Espero todo marche bien por alla.

Sinceramente,

Robert M. King
Departamento de Botanica

357-2546

November 26, 1984

Dr. Angel L. Cabrera
Herbario, Instituto de Botanica Darwinion
Labarden 200, 1640 Martinez
San Isidro, Buenos Aires, Argentina

Dear Dr. Cabrera:

I am writing to tell you that I plantto be in Argentina in early January of 1985. I am looking foreward to meeting with you again.

My main purpose for my trip is to study and collect Compositae. Would it be possibe to obtain a car from your instituto? I am planning to stay one month.

With kind regards,

Sincerely yours,

Robert M. King
Department of Botany

May 3, 1985

Dr. Angel L. Cabrera
Instituto de Botanica Darwinion

San Isidro
Buenos Aires, ARGENTINA

Dear Dr. Cabrera:

I am writing to tell you that I had a very good trip except for one thing. In sending my collections back to the USA, a package got lost. I am upset about it, but nothing can be done about it. I got a number of good things and I will be sending you a set for you collection. Please let me know if you have to change any names.

Thanks again for all your help. I plan to return in January 1987

Thanks also for the books. My book on the
Eupatorium will be
sent you a
copy.

Sincerely yours,

Robert M. King
Department of Botany

June 18, 1985

Dr. Angel L. Cabrera
Instituto de Botanica Darwinion
San Isidro, Buenos Aires, Argentina

Dear Dr. Cabrera:

Please find enclosed the photographs that were taken during my visit to Argentina in January. I hope that you like them and that they arrive in good condition.

The labels for my collections are still being typed. I hope that they will be ready later this summer.

Sincerely,

Robert M. King

Department of Botany

March 31, 1986

Dr. Angel L. Cabrera
Instituto de Botanica Darwinion
San Isidro, ARGENTINA

Dear Dr. Cabrera:

Thanks for your recent letter in which you requested a photograph of a type specimen in our collection. I have made the request that the photograph be made and sent to you. I do not know how long it will take.

I hope that by now you have recieved a set of my collections that I made in Argentina over a year ago.

Sincerely,

Robert M. King

Department of Botany

June 1, 1987

Dr. Jose Calzada, Director
Escuela de Química
Universidad de Costa Rica
San Jose
Costa Rica

Dear Dr. Calzada:

I would like to take this occasion to thank you for showing me around your school during my recent visit. It was very interesting to learn of your projects.

I also want to tell you how much I enjoyed working with Dr. Victor Castro of your school. He was a great help to me.

Sincerely yours,

Robert M. King

Department of Botany

357-2546

February 15, 1985

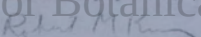
Dr. Gerald Carr
Department of Botany
University of Hawaii
3190 Maile Way
Honolulu, Hawaii 96822

Dear Dr. Carr:

I am writing to you as suggested by Peter Raven. I assume that you have recieved the cppies of the correspondence that Peter sent you.

I would like to ask you to join our project on chromosome of the Compositae. I have just returned from my trip to Argentina with more vials of buds for study. I hope to hear from you soon.

Sincerely yours,



Robert M. King

Department of Botany

April 20, 1985

Dr. Gerald Carr
Department of Botany
University of Hawaii
3190 Maile Way
Honolulu
Hawaii 96822

Dear Dr. Carr:

I am writing to you again because Peter Raven has suggested that I do so. Would you be willing to count chromosomes of Compositae and be willing to work in the Raven series on chromosome numbers. I assume that you are busy but it also looks as if Peter really would like to see you in this project.

Sincerely,

Robert M. King
Department of Botany

August 21, 1985

Dr. Gerald D. Carr
Department of Botany
University of Hawaii
Honolulu, Hawaii 96822

Dear Dr. Carr:

Thanks for your letter which arrived a long time ago. Please forgive the delay in answering it, as I decided to wait until you had returned to Hawaii.

I am pleased to learn that you have decided to participate with us in a survey of chromosome numbers of Compositae. None of the conditions under which you would have to work would be objectionable. We realize that you have other commitments as we all do.

Peter has no involvement in this project. I believe that he is only eager to see the series and project continue.

Your suggestion about coauthorship is good. It would really be the only fair way to handle things. I would be very pleased if Don Kyhos were to participate.

The scope of this project is worldwide. Most of the collections, however, are from South America. The buds are collected along with material for biochemical study that I make for another project. I have a trip planned for Peru in February, 1986 and another for Western Australia in the fall of 1986.

I hope that you have received the vials that Mike Powell sent to you sometime ago. Also, last week I sent you some that I collected in Argentina.

I hope that I have answered all of your questions. I look forward to hearing from you.

Sincerely,

Robert M. King
Department of Botany

December 12, 1986

Dr. Gerald D. Carr
Department of Botany
University of Hawaii
Honolulu, Hawaii 96822

Dear Dr. Carr:

Enclosed please find reprints of the three treatments that we have published in the Raven chromosome counts series.

We are now planning another paper on counts of Eupatorieae. We would like to include you in this one. Mike Powell has finished his batch of vials, and Jim weedin has promised his by the end of the year.

If you could send me a list of the collection numbers that you have, I could send you the names of the Eupatorian ones that should be emphasized.

The last batch of vials that I sent to you were from Australia and include no Eupatorieae.

Sincerely yours,

Robert M. King
Department of Botany

January 6, 1987

Dr. Gerald D. Carr
Department of Botany
University of Hawaii at Manoa
3190 Maile Way
Honolulu, Hawaii 96822

Dear Dr. Carr:

Thank you for your letter and list of collection numbers. I am pleased at the results that you have obtained, especially considering the age of the material.

I am enclosing the list of numbers with the Eupatorieae marked in green. The numbers with red I would request that you make a special effort.

I have indicated the genus on the numbers that I know. I still do not have my vouchers from Australia yet. If you want the species on any of these, just let me know.

When you have completed the Eupatorian numbers we will write a new paper on the tribe. I am planning to spend a month in Brazil and Bolivia beginning on January 25. I expect to get some more Eupatorieae but we probably will not want to include them in the next paper.

Thanks again for your efforts.

Sincerely,

Bob King
Robert M. King

Department of Botany

August 12, 1987

Dr. Gerald D. Carr
Department of Botany
University of Hawaii at Manoa
3190 Maile Way
Honolulu, Hawaii 96822

Dera Dr. Carr:

Enclosed please find the names for my collections from Australia,,, Bolivia and Costa Rica. You will note that I have checked some of the numbers in red. These are all Eupatorieae and those with the extra checks are the most important.

I am still working on the Eupatorieae chromosome paper and would ask that you send me all of the Eupatorieae counts that you have done. I will then include them in this paper. When the paper is written we will send you a copy for your comments.

With kind regards,

Sincerely,

Robert M. King
Department of Botany

April 13, 81

Dear Dr. Carr,

Please find enclosed 2 vials of
bees collected in Dominica, West Indies
by Dieter Wasshausen.

The names are

Digitized by Hunt Institute for Botanical Documentation
1582 " trigonocarpa

would you attempt to count these.
Perhaps the #s can be added to
the present paper.

Thanks

Bob King

June 19, 1989

Dr. Gerald D. Carr
Department of Botany
University of Hawaii at Manoa
Honolulu
Hawaii 96822

Dear Dr. Carr,

Please find enclosed a copy of the remaining list of names for my collections from Australia. In a few days I will be sending you a couple of vials that I wish you would attempt to count. If you are not successful I can get more material from our greenhouse. Hope that all is well with you.

R.M.K.
Sincerely,

Robert M. King
Department of Botany

UNIVERSITY OF CALIFORNIA, BERKELEY

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SANTA BARBARA • SANTA CRUZ

UNIVERSITY HERBARIUM
DEPARTMENT OF BOTANY
BERKELEY, CALIFORNIA 94720

11 December 1981

Robert M. King
Botany, National Herbarium
Smithsonian Institution
Washington, D. C. 20560

Dear Bob,

I kept expecting another call from you re Art Weston's whereabouts. Lauramay Dempster was able to tell me that there had been a telephone call from him about two weeks ago. She says he is very dilatory about writing. Following are two telephone numbers in the Perth area:

Home: 368-1471 (13 Third Ave., Kensington, W. A. 6151)

Work: 367-8055

Regarding Baja California, I returned after Thanksgiving from a trip the entire length of the peninsula. The northern part was pretty dry and will still be so unless recent winter storms have extended southward into it. The Cape Region was in wonderful green condition. The annuals (that followed the heavy late October storms) were mostly passed, but such showy perennial vines as Merremia aurea and Dyssodia speciosa were in full bloom.

I'm enclosing Xerox copies of some travel information that I have dispensed during the years. If it doesn't ~~answer~~ answer all of your questions, drop me a line, or give me another call.

Sincerely,

Annetta Carter
Research Associate

And Thanks for the last bunch of reprints. They arrived just before I went to Mexico to attend the Mex. Bot. Congress.

I prepared this for the reasons
when they went on a bus trip
down the peninsula.

BAJA CALIFORNIA BOTANICAL ITINERARY

First day - Tijuana to San Quintín.

On the cliffs as you approach Ensenada there is a large, white Hudleya. You'll have to ask Reid Moran the species. (I think that the photo and the text are transposed on pp. 78-79 of THE book.)

Where the highway crosses a small arroyo north of Santo Tomas there is a good stand of Matilija poppies. They should be coming into bloom.

Fraxinus trifoliata and Ptelea aptera^{2 or 3} common roadside shrubs in this area.

On hillslopes south of Santo Tomas, and perhaps north also, are large clumps of "velvet cactus", Bergerocactus emoryi. It is golden brown and beautiful when seen with back-lighting. A tree-like cactus with many stout branches occurs on the slopes as you approach the San Quintín plains. It is the "candelabra cactus" or "cochal", Myrtillocactus cochal.

Rosa minutifolia is abundant in this area, too, but I doubt that you can find it from the bus. Also, there has been a great deal of agricultural development and this has eliminated many of its habitats.

By the time you have reached the San Quintín plains, you will be just about out of the southern limit of western sycamore.

If you don't have time to walk out on the dunes in front of the Presidente Hotel at San Quintín when you arrive, be sure and do it early next morning.

Second day - San Quintín to Cataviña.

Along the coast south of San Quintín is a fine series of marine terraces.

Aesculus parryi is abundant on north-facing canyon slopes. It usually puts out its leaves in November and loses them in April. It will be interesting to note if the leaves have dropped in this year of heavy rainfall. One sees an occasional shrub out on the dunes or coastal mesas.

At El Rosario the road turns inland and follows the arroyo for a few miles. In the Fall, when peppers are ripe, they are brought up this arroyo away from the coastal fog and spread out on the slopes to dry--a brilliant red carpet. Where the road turns right and crosses the arroyo there is a dense stand of an Agave. And if you look up the arroyo you will see an outcrop of huge castle-like cliffs. For me, this is where Baja California begins!

^{→ A. deserti?}

The highway (new road) roller-coasters along hill-tops for miles. Soon you will see lots of barrel cacti, "biznaga" (Ferocactus)--I can't remember the species, but they are almost red. And on the crest of the ridges you will begin to see small "cirios", Fouquieria (ditia) columnaris, and an occasional "cardón", Pachycereus pringlei.

But the real treat for the day, and perhaps for the trip, comes when you reach the granite boulder-cirio-elephant tree area before Cataviña. I hope that the bus will make several stops along here. It is a photographer's paradise: huge wind-and-water eroded granite boulders, the "cirios" in all sorts of fantastic curves, and the elephant trees (Pachycormus discolor) with their grotesque thick trunks and papery bark. (T.S. Brandegee wrote a note to Katherine on it before they were married.) In many places the Pachycormus is covered with a bright orange dodder. From the Hotel, walk along the road to a big arroyo and follow up the arroyo a ways. The following should be abundant: Calliandra californica flowers like red pen-pans; Cardiospermum corindum, a woody vine with tendrils, small white fls + inflated papery fruits; Pedilanthus macrocarpus - clumps of leafy gray stems with bird-like flowers & fruits.

There stops were based
on hotel locations.

Third day - Cataviñá to San Ignacio

At the latitude of Punta Prieta (where a paved road goes east to Bahía Los Angeles) "ocotillo" (*Fouquieria splendens*) is beginning to look different—the wand-like stems don't fan out from right down at the base and aren't so straight. It and the more tree-like southern species, "palo Adán" (*F. diguetii*) are intergrading in this area.

This is the day that you leave the cirios behind and see lots of *Yucca valida*. And you will begin to see more "torote", *Bursera microphylla*, whose thick, yellow-green trunks may remind you of *Pachycormus*, also you will begin to see "lomboy", *Jatropha cinerea*, a shrub with gray-green spreading branches which are very limber. It will probably be leafless. The juice (not milky even tho it is a Euphorb.) stains your clothes permanently; also the juice prevents chapped lips.

After you leave THE MONUMENT at Lat. 28° N. and start across the Viscaíno Desert towards San Ignacio, off to the southwest you can see the peaks of Sierra Santa Clara where Gentry did excellent field work. And off to the east is the Sierra San Francisco where the famous cave paintings are located.

The old road skirted the foothills of the sierra instead of going out across the desert. It was incredibly rough south of El Arco and one jolted along at 5-7 miles per hour. When one finally reached the edge of the mesa and looked down on green San Ignacio with its thousands of palms, it seemed a veritable oasis.

Fourth day - San Ignacio to Loreto.

If feasible, sit on the left-hand side of the bus.

East of San Ignacio there is lots of *Larrea*, "creosote bush", or "gobernadora". Also there is *Cercidium praecox*, "palo brea", a spreading tree with its trunks bright green clear to the base. *C. microphyllum*, which is also along here, isn't so flat-topped and the trunks are gray at the base. Both of these should be in bloom.

The trees on the volcanic flows as you approach the cones of the Tres Virgenes are *Pachycormus discolor*, elephant trees or "copalquin".

The mining town of Santa Rosalía I often refer to as the Jerome (Ariz.) of Baja California. One can see lots of interesting old equipment.

South of Mulegé is twenty-mile-long Concepción Bay. Its beautiful clean beaches are now becoming littered and the water polluted. Soon after you reach it, there is a small cove, Santispac, bordered with mangroves. Before the highway, this was a wonderful campsite—and there were clams to dig!

If you look to the left when the highway starts to climb away from the south end of the bay, you can see one of the densest (and tallest) stands of "cardón" (*Pachycereus pringlei*) in the peninsula.

After you pass the crest of the grade south of Concepción Bay, you look out to the south over the Llanos de San Juan and the north end of the Sierra de la Giganta. The highest, twin-peaked mountain is Cerro Giganta (alt. 5790'). (It is the peak that I climbed on the 1947 trip with Miss Alexander and Miss Kellogg. And I gained a certain amount of fame in the area for having climbed it.) After the rains, these plains are a sea of green because of a tree canopy of "palo blanco" (*Lysiloma candida*), *Cercidium* and *Prosopis*, "mesquite". And the dark green stems of the cardón rise up above the tree tops.

Several of the roadcuts in the hills south of the Llanos de San Juan have exposed lots of marine fossils.

When you come out of the hills you see the coastal plain where Loreto lies.

Fifth day - Loreto and vicinity.

The fan palms in ^{Loreto} town are Washingtonia robusta and also Erythea brandegeei (the common one of the Cape Region).

I hope that you will take the side trip to Mission San Javier, in the sierra ca. 20 miles southwest of Loreto. There are three taxis in town that have sufficient clearance to make the trip. The road up the eastern escarpment is the most spectacular in the peninsula and the church is the handsomest and best-preserved of all Baja California missions. I always marvel at the spiral staircase with a step and a section of the column carved out of a single piece of stone (up to the choir loft) and of mesquite (up to the bell tower). And the olive trees in the "huerta" back of the houses are more impressive to me than any of the old ones I saw in Greece. You should start by 8 a.m., or at least before 9, and have the hotel fix a lunch. It takes about two hours to reach San Javier. * Said to be 200+ years old.

The broad arroyo is lined with "palo blanco" (Lysiloma candida), a beautiful tree with white trunk and spreading crown. Its legumes will be turning reddish-brown. The shrub in the middle of the arroyo is Hyptis emoryi, called "salvia" by the local people.

Two or three miles up the arroyo, on the left hand side, is a photogenic tree, Ficus palmeri, "higuera", clinging to the rock wall. Those farther up the canyon are more difficult to photograph.

When the canyon narrows, a common shrub along the road is Acacia brandegeei, "vinorama". It should be in bloom. (In the Cape Region, the common name "vinorama" refers to A. farnesiana.) There is also "palo chino", A. peninsularis along here. A large and battered tree of "palo chino" stands at the mouth of a side arroyo on the right-hand side, Arroyo San Telmo (just before the road leaves the canyon and starts up the first grade). A hundred yards up this side canyon is a big natural swimming pool, but the streambed has been littered by picnickers.

"Cuevas pintas" at about 7.5 miles from Loreto is the sight of some Indian paintings (no animal figures), but they are now so eroded away that it is scarcely worthwhile walking the hundred yards to see them. The ~~box-leaved~~ ^{Agave} on nearly vertical canyon walls is A. schottii. Rancho Las Parras (ca. 10 miles from Loreto) is in a deep canyon on the left-hand side of the road. In the "huerta" are mangoes, papayas, figs, olives, oranges, grapes. The orange trees are so tall that the fruit in the top is never picked. There are pomelos, too. The ranch was started by a Portuguese sailor who decided to stay in Loreto and married a local señorita. Every once in a while he would go to sea again and bring back unusual plants (like asparagus!) for his ranch—or at least so his very elderly daughters have told me. The cone-like peak to the north of the ranch (from Loreto it tapers out sharply on the skyline) is Pilon de las Parras. It is only about 3700 feet high. Helen and I (and a guide) climbed it about 12 years ago.

After you cross the crest of the sierra (only about 1600' feet here), you come to Rancho San Matías, a cluster of three or four houses (cattle and goats). Then the road goes over a slight grade and comes down into Arroyo San Matías. On the left-hand side of the road, just as it enters the bottom of the arroyo is a large shrub of Cassia goldmanii (a narrow endemic). It should be in bloom.

A stop at Rancho El Horno of Manuel Velis would be interesting, to see his huerta, perhaps buy some oranges, see the olives curing in large vats made of cow hides, and see the construction of his ranch house.

Sixth day - Loreto to La Paz and on to Cabo San Lucas (a long day).

If feasible, sit on the right-hand side of the bus. This is so that you can have good views of the Sierra de la Giganta where I have spent so much time these last thirty years!

About 13 miles south of Loreto the road climbs the second slight grade and it may stop at a wide "mirador" for a view of the Gulf, the south end of Isla Carmen, and rugged Isla Danzante just offshore from Puerto Escondido. Look to the left as the road starts down the grade and on the beach of the first little bay you can see the fig tree pictured opposite p. 68 in the flower book. It is a most unusual habitat for *Ficus palmieri*. It looked the same when I first saw it 30 years ago. The old road went right beside it and ended at Puerto Escondido.

Puerto Escondido lies about 4 miles ahead. Ivan Johnston collected here in 1921 and followed a deep canyon into the sierra. This is the type locality for several of his species. When I passed by here the first of May *Cercidium* trees were just coming into bloom. Between here and through the mountain and out onto the Llanos de Magdalena there are three species of *Cercidium*: *C. microphyllum*, *C. praecox* and *C. sonoreae*, the latter a hybrid between the other two.

After passing through the sierra (south of the really rugged part), ^{the road} gradually descends a long slope out onto the Llanos de Magdalena. As you approach the coast you get into a "fog desert". Clumps that resemble bird's nests are on the "palo Adán" (*Fouquieria diguetii*) trees. These are *Tillandsia recurvata*. And the stems of the shrubs and cacti are covered with lichens. The sprawling, many-branched cactus is "pitaya agria", *Machaerocereus gummosus*, one of the two pitayas with delicious fruits. They are ripe in late summer. (If the taxi driver took you past my "casita" with the blue door in Loreto, it is surrounded by this "pitaya!")

All of the agriculture and the boom towns have developed during the past 20-25 years. Except for a cattle ranch or two, ^{the Llanos de Magdalena were} it was untouched desert 30 years ago. The old dirt track followed the coast quite closely.

At the edge of the mesa where the highway starts down to the La Paz plain, there are quite a few low shrubs of "algodón", *Gossypium harknessii*.

South of La Paz the vegetation is much more dense--almost a jungle after the rains. Between the old mining town of El Triunfo and the more active town of San Antonio you may see trees of *Cassia emarginata* in bloom. It is leafless when in bloom—a showy mass of deep yellow. Also, south of La Paz you will see both *Pachycereus pringlei* and *P. pecten-aboriginum*. And in addition to *Bursera microphylla* is *B. hindsiana* (which you may have seen as far north as Concepción Bay where it is close to the road).

In the village of San Antonio are attractive fences and house walls made of stems of "palo de arco", *Tecoma stans*. I hope that the bus makes a slight detour to pass thru this village. These stems are also used to make cradles for babies and crates for "panoche" and for vegetables. New branches shoot up when old stems are cut; so it is a renewable resource.

San José del Cabo is a subtropical garden. It was from here that Brandegee made his treks into the Cape Region mountains. From the highway it is hard to believe that the canyons in the mountains have beautiful running streams and big pools in granite rock.

Buen viaje!

Annetta Carter
May 1978

These are just a few of
the plants you will see.

POSSIBLE CAMPSITES IN BAJA CALIFORNIA, 1975

1). South of Santo Tomás. At summit of grade (7 miles south of Santo Tomás) there is a wide place where you can turn left (East) onto a little hill (beware of broken glass and other litter at start of this turn-off). Follow a tiny road (a track) over the crest of the hill to the saddle beyond. Here one can camp out of sight (and almost out of sound) of the highway. If there have been recent rains, this track may not be passable. [In November we crossed the border at Tijuana at 9:40 a.m. and had lunch here at 12:45 p.m. —after a stop of about 45 minutes in Ensenada.]

2). A possible, but not too good campsite is among the hills 39 miles south of Santo Tomás. On the left (East) side of the highway a dirt track turns off towards separated sloping cultivated fields. Before reaching them, one comes to openings between shrubs and other low vegetation. There is too much cholla cactus here for comfort, and it is within sight of the highway. From here on to south of San Quintín there are settlements and agriculture. Besides it is near the coast and there is usually lots of dew at night. South of San Quintín there are possible campsites on coastal bluffs, but wood is scarce.

3). In November, we reached El Rosario at 4:30 (I wasn't driving my VW bus much over 50 mph—which equals the posted limit of 80 km. per hour) having left the border at 9:40 a.m.), and we camped 3 miles east of El Rosario in a side arroyo — just before the highway started roller-coasting over the hills. We turned left on a little track and went far enough to be out of sight of the highway. Very little wood available. We burned dead Agave bases for a warming fire. Turn them upside down.

4). Next day we left at 7:40 a.m. and were at Punta Prieta (El Presidente Hotel) turn-off to Bahía de Los Angeles by noon [139 miles] with lots of stops for fotos and botany. This is the "cirio" country and you can find lots of campsites— if you go slow enough to see possible turnouts. One grand campsite that we had in January on our return trip was just south of Laguna Chapala Seca [42 mi. S. of El Presidente Catavina; 8 mi. S. of junction with dirt road (east) to Rancho Laguna Chapala Seca]. Turn left (easterly) across low shoulder onto the old Baja California dirt road. We went north on it a hundred yards or so before making camp on the edge of a little arroyo.

5). There were lots of campsites along the old road to Bahía de Los Angeles. "Quien sabe" if you will be able to get off the new paved road anywhere. Bahía de Los Angeles will be jammed with cars and people. Follow the road south for a mile or so to look for a campsite. Or there may be places near the sandspit at the north side of town.

6) A good off-hiway route (4 wheel drive) is from Bahía de Los Angeles south— first to Bahía Las Animas (a side road to left towards Gulf) and then on to Bahía San Francisco (about a day's trip S of Bahía de Los Angeles). Return to the Hiway via Pozo Aleman and Los Arcos. When you head east across the coastal plains towards Los Arcos, you come to Cuesta de los Reyes, one of the nastiest little grades in the peninsula: steep, lop-sided, rough. This route isn't much used; so be sure your car is in good condition and that you have enough gas & H₂O

Tepic

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HERBARIUM
DEPARTMENT OF BOTANY

BERKELEY, CALIFORNIA 94720

25 November 1975

Edwin W. Tisdale
915 West C. Street
Moscow, Idaho 83843

Dear Ed and Morah:

Of course I remember you two and the pleasure that it was having you with us in Berkeley!

I am enclosing a Xerox copy (of a Xerox copy) of a letter that I wrote last week. It will answer some of your questions. I have driven the new highway several times (both in my VW bus and in the Calif. Acad. Sci. heavier vehicle). It is now much easier to get to Baja California, but I much preferred the old, slow road.

In the first place, I would plan to drive the entire length of the peninsula and take the new ferry from Cabo San Lucas across to Puerto Vallarta. I think it runs three times per week.

After you leave El Rosario, you will want to start to loiter—especially in the cirio (Idria,—or now bouquieria)—elephant tree (*Pachycormus*) and granite boulder country around Catavina. At Santa Ynés (just beyond, e.g. southeast of the Catavina El Presidente Hotel) you can ask for permission to camp in the arroyo north of the ranch house, restaurant and new motel. To get a glimpse of the Gulf and the islands midway down the peninsula, you may want to take the side trip out to Bahía de Los Angeles. It has become pretty touristized of late. (Sra. Diaz's turtle dinners are supposed to be extra special!) Enquire there if the road to San Borja is passable for your VW. It is an interesting old mission and you can return to the Highway by a different route. At Guerrero Negro, it might be well worth your while to go out to the whale watching post on Scammon's Lagoon. I think it will be whale season. In case you are wishing for a motel by the time you reach San Ignacio (a beautiful oasis), ask the way to the Fischer's motel on the far side of town. The interesting thing about Santa Rosalia is all of its antique mining equipment as one enters from the north. Also, there is an excellent bakery in Santa Rosalia. About 12 miles south of Santa Rosalia one can follow little side roads and get near to the beach to camp. But ask the ranchers or the fishing camp people for permission should you settle down near them. Mulegé has become touristized, but it is worth driving around the town and out towards the point—just to get an idea of the pueblo. [Get gas at San Ignacio and in Mulegé rather than in Santa Rosalia.] *And visit the mission for an overview of the area.*

Shortly after leaving Mulegé, you will come to Bahía de la Concepción which was an ideal place to camp before the highway. You might find a semi-private camping spot at El Requesón (a long sandspit and island which you reach shortly after the road returns to the Bahía). There is a "Playa Aceso" sign where the road turns off to the left. Here, instead of taking the left-hand fork out onto the sandspit, take the right-hand fork and follow the Gulf about 3 km (over a slight rise and past an isolated mangrove) to a small cove with non-sharp coral sand. There are several spots here where one can squeeze off the old road.

for a hotel, go to Hotel Davis.

This area is now a real estate subdivision!

In Loreto, you may find a place to camp along the curves of the beach about a mile north of town. Or, if you like, you are welcome to camp at my place about a mile northwest of town out in the cactus. ~~After mid-January I might possibly be there. Ask at the postoffice or at the Garayzar home (across the street from the church) where Anita's casita is or if she is in town. And if you want a motel in Loreto, go to the Fray Junipero (also across the street from the church but behind the Garayzar house). From Loreto you will want to be sure to make the trip up to Misión San Javier. The road up there is the most spectacular in the peninsula. And at the Misión ask the old keeper of the keys to allow you to go up into the tower. The spiral staircases are a marvel—especially the mesquite ones leading up to the bells. And also, ask if you can visit the "huerta" behind the houses on the west side of the only street. The olive trees are bigger and more gnarled than any I saw in Greece. About 9-10 miles south of Loreto is a good beach, Mopoló and possible campsite. It is too crowded at Puerto Escondido.~~

** his daughter now is the keeper. Give her a tip for opening*

You will be amazed at the agricultural development on the Llanos de Magdalena. In 1947 there were only a couple of cattle ranches in this area. ~~I've heard that the trip out to Bahía San Carlos is interesting. Yes, + get a boat to take you thru the mangrove lagoons + explore the huge sand dunes.~~

If you plan to take the ferry from Cabo San Lucas instead of taking the one that goes over to Mazatlán, I'd go south along the Pacific side of the Cape rather than the Gulf side. The road isn't paved south of Todos Santos and is interesting. But be careful about swimming on those Pacific beaches. They have dangerous rip tides. About 23 miles south of Pescadero is a beautiful beach with fascinating wind-blown vegetation. I call it the Bonsai beach. Should you want a place to camp at the tip, I think the most interesting area is what I call "Punta de la Luna" ² because the erosion reminds me of pictures of the moon surface. It is 5 miles east of the Pemex station in Cabo San Lucas or about 15 or 16 miles west of San José del Cabo (should you be going south along the Gulf side). There are several branches in the little road that leads down to the coast (perhaps a mile from the Playa Aceso sign), but the part I like best is on the point above a wrecked Japanese freighter. Unfortunately, it is getting a bit littered here! ~~At Turin Delphin Hotel are excellent life size reproductions of the famous Indian cave paintings.~~

Since you won't be there at Christmas holiday time, I imagine that you could arrange for ferry crossing the day before at the La Paz office. If you want a hotel in La Paz, I'd suggest La Purísima. It is more reasonable than La Perla (right on the water front and with a fairly good restaurant), but it is back in the center of town. Or more picturesque is Quinta Dorita (but the beds were terrible when I was there a couple of years ago). And next door to it is the Hosteria del Convento with its little courtyard restaurant.

Some references are given in the enclosed copy of last week's letter. I'll add some more tonight at home.

Unfortunately, I won't be here when you come thru, but if you have more questions please feel free to write to me. As co-executor of my brother's will, I have to be in Cuernavaca the first of the year.

I know that Helen would love to see you. New medication has her Parkinson's fairly well under control, but sometimes she seems sort of "detached"—not quite her old self. She is at home and I am in contact with her all of the time. We live only a few blocks from each other.

Have a wonderful trip. The peninsula is really different, "el otro México"!

Cordially,

Annetta (Anita in Loreto)

Annetta Carter
Research Associate

2) Now it is crowded with campers!
X1. 1981

1) At Las Palomas S. of Loreto. The food is excellent. There are cabins, if needed, but want to camp.

357-2545

December 22, 1981

Ms. Annetta Carter
Herbarium
University of California
Berkeley, CA 94720

Dear Annetta:

Many thanks for your letter with the information about Arthur Weston.

The information that you send on Baja California should be very helpful. I am very eager to see that part of Mexico for the first time this spring (early April).

I don't know if I told you or not but the MS for the genera of the Eupatorieae will be submitted to the Annals of Missouri Bot. Garden prior to July 1982. We will, of course, send you a copy.

Sincerely yours,

Robert M. King
Department of Botany

357-2545

February 22, 1982

Mr. Julio A. Castilla
Asesor Agrícola
Embajada de los E. U. A.
Ave. Garcilaso de la Vega, 1400
Lima 1, Peru

Dear Mr. Castilla:

I would like to thank you for sending my plant specimens to me via the pouch. Everything has arrived safely.

Sincerely yours,

Robert M. King
Department of Botany

357-2546

November 9, 1982

Mr. Julio A. Castilla
Asesor Agricola
Embajada de los E. U. A.
Ave. Garcilaso dela Vega, 1400
LIMA 1, Peru

Dear Mr. Castilla:

I would like to request that you allow me to send back to the
museum here in Washington some plant specimens that I will collect in
Peru during the month of January, 1983. I would like to send them in the
pouch or by APO. You will recall that I visited Lima earlier this year.

Sincerely yours,

Robert M. King

Department of Botany



UNIVERSIDADE FEDERAL DO PIAUÍ
Herbário Graziela Barroso
CCN - Departamento de Biologia
Campus da Ininga
64.000 - Teresina - PI.

Campus da Ininga, 04 de Maio de 1982

Ilmo. Dr.
R. KING
U. S. National Herbarium
Dept. of Botany
Smithsonian Institution
Washington, D.C. 20560, U.S.A.

Prezado Dr.,

Somos do Herbário Graziela Barroso - TE e desde já gostaríamos de manter contacto, sempre que possível, com V. Sa., para fins de intercâmbio.

Nosso Herbário deposita exsiccatas das Divisões Pteridophyta e Angiospermae (Monocotyledoneae e Dicotyledoneae) representativas, em sua maioria, da flora de plantas vasculares do Estado do Piauí.

Gostaríamos de receber confirmação a respeito da(s) família(s) botânica(s) e gênero(s) de vossa preferência e especialidade. E, principalmente, saber se V. Sa. pode receber exsiccatas nossas para que sejam determinadas botanicamente.

Por outro lado, seria importante para nós, se o vosso endereço fosse confirmado.

Nos despedimos, aguardando uma resposta com a maior brevidade possível, ao mesmo tempo que renovamos protestos de estima e consideração.

Atenciosamente,

A. ALBERTO JORGE F. CASTRO
Curador do Herbário Graziela Barroso

357-2545

May 25, 1982

Dr. Alberto J. F. Castro
Curator
Herbario Graziela Barroso
Fundacao Universidade Federal do Piaui
CCN - Departamento de Biologia
Campus da Olinga
64.000 - Teresina - PI. Brasil

Dear Dr. Castro:

Thank you for your recent letter. We would be willing to identify duplicate specimens of the family Compositae, collected anywhere in Brasil.

Looking forward to hear from you soon,

Sincerely yours,

Robert M. King
Department of Botany

UNIVERSIDAD DE COSTA RICA
Ciudad Universitaria Rodrigo Facio
Costa Rica, América Central

354967

16 May , 1983.-

Dr. R. M. King
Smithsonian Institution
Dept. of Botany
Washington D.C.

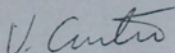
Digitized by Hunt Institute for Botanical Documentation

Dear Dr. King,

I am enclosing some herbar specimens in order
to verify its classification.

Prof. Ferdinand Bohlmann is interessted in them. Please
send the results and samples to him.

Sincerely,


Víctor Castro

School of Chemistry
University of Costa Rica

March 17, 1987

Prof. Dr. Victor Castro
Escuela de Quimica
Universidad de Costa Rica
Costa Rica

Dear Dr. Castro:

My plans changed so that it was impossible to go to Costa Rica yesterday. I tried to call you at your office but could not reach you. I tried to call you at home but I was told that there were Over 20 Victor Castros in San Jose.

In any event I would like to come to Costa Rica in about one month/ I will write to you again when my plans are definite. I look forward to seeing you then.

Sincerely,

Robert M. King
Robert M. King

Department of Botany

March 30, 1987

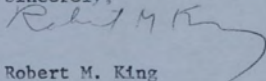
Dr. Victor Castro
Escuela de Química
Universidad de Costa Rica
San Jose
Costa Rica

Dear Dr. Castro:

I am writing to tell you that my plans for collecting in Costa Rica are now firm. I will be arriving in San Jose via Eastern Airlines on the 18 th at 8:15 pm. I hope that time will not be inconvenient for you to meet me. I have requested a room reservation for the Hotel "Don Carlos" where I have stayed previously. I expect to stay about 2 weeks and would like to start collecting on the 19 th if at all possible.

Do you have facilities for drying material before it is sent to Prof. Bohlmann?

Sincerely,



Robert M. King

Department of Botany

June 1, 1987

Dr. Victor Castro
Escuela de Química
Universidad de Costa Rica
San Jose, Costa Rica

Dear Victor,

I first want to thank you for all of your help while I was in Costa Rica. It was indeed a pleasure to me and have you as a friend.

I am inclosing the list of names for our chemical plant collections. It does not contain anything very interesting but I hope that you find them worthwhile.

I am listing a locality of a species of *Reteravenia* that was collected in Costa Rica.

The vouchers will be sent soon.

Digitized by Hunt Institute for Botanical Documentation

Again, thanks for all of your help.

Sincerely,

Robert M. King
Department of Botany

COSTA RICA

- 9656 *Neomirandea eximia* (B.L.Rob.) K & R
 9657 *Ageratina anisochroma* (Klatt) K & R
 9658 *Liabum bourgeauii* Hieron.
 9659 *Tagetes foetidissima* DC.
 9660 *Viguiera cordata* (Hook & Arn.) D'Arcy
 9661 *Viguiera cordata* (Hook & Arn.) D'Arcy
 9662 *Erigeron annuus* (L.) Pers.
 9663 *Cirsium subcoriaceum* (Less.) Petrak
 9664 *Senecio oerstedianus* Benth. ex Oersted
 9665 *Brickellia argyrolepis* B.L.Robinson
 9666 *Verbesina sublobata* Benth. ex Oersted
 9667 *Neomirandea angularis* (B.L.Rob.) K & R
 9668 *Pentacalia streptothamma* (Greenm. ex Standley) H. Rob.
 9669 *Neomirandea eximia* (B.L.Rob.) K & R
 9670 *Neomirandea parasitica* (Klatt) K & R
 9671 *Mikania banisteriae* DC.
 9672 *Neomirandea eximia* (B.L.Rob.) K & R
 9673 *Pentacalia candelariae* (Benth. ex Oersted) H. Rob. & Cuatr.
 9674 *Neomirandea guevarii* R.King & H. Robinson
 9675 *Neomirandea parasitica* (Klatt) K & R
 9676 *Neomirandea guevarii* R. M. King & H. Robinson
 9677 *Spilanthes urens* Jacq.
 9678 *Baccharis trinervis* (Lam.) Pers.
 9679 *Vernonia salzmännii* DC. = *argyropappa*
 9680 *Archibaccharis schiedeana* (Benth.) J.D.Jackson
 9681 *Podachaenium eminens* (Lag.) Sch.-Bip.
 9682 *Mikania gonzelezii* B.L.Rob. & Grenm.
 9683 *Munozia wilburii* H. Robinson
 9684 *Ageratina anisochroma* (Klatt) K & R
 9685 *Koanophyllon pittieri* (Klatt) K. & R
 9686 *Galinsoga quadriradiata* Ruiz & Pavon.
 9687 *Pseudogynoxys cumingii* (Benth.) H. Robinson & Cuatr.
 9688 *Pentacalia streptothamma* (Grenm.) H. Robinson & Cuatr.
 9689 *Senecio costaricensis* R.M.King
 9690 *Ageratina anisochroma* (Klatt) K & R
 9691 *Smallanthus maculatus* (Cav.) H.Robinson var. *adenotricha*
 9692 *Podachaenium eminens* (Lag.) Sch.-Bip.
 9693 *Critonia daleoides* DC.
 9694 *Ageratina ligustrina* (DC) K & R
 9695 *Neomirandea angularis* (B.L.Robinson) K & R
 9696 *Ageratina ixiocladon* (Benth. ex Oersted) K & R
 9697 *Schistocarpa paniculata* Klatt
 9698 *Smallanthus latisquamata* (Blake) H. Robinson
 9699 *Pentacalia streptothamma* (Greenm. H.Robinson & Cuatr.

July 11, 1987

Dr. Victor Castro
Escuela de Química
Universidad de Costa Rica
San Jose
Costa Rica

Dear Victor,

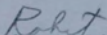
I hope that you recieved the list of names that I sent. I returned the other plants to Luis.

I would like to request that you collect viable seed of Neomirandea to send me. I need as many samples as possible even of the same species. I am particularly interested in Neomirandea angularis and guevarii. I am eager to get seed of all species, however.

There is a chance that I will go to Panama on another project. If I do, I will get chemical material of other species of Neomirandea.

I hope that all is well with you.

Sincerely,


Robert M King

Department of Botany

UNIVERSIDAD DE COSTA RICA
Ciudad Universitaria Rodrigo Facio
Costa Rica, América Central

San José, 15. 7. 87.

Dr. Robert M. King
Smithsonian Institution
Washington D.C.

Dear friend:

Thank you for the list of names of the material we collected.
We have begun the study of the various extracts. Senecio is
showing some new alkaloids.

With respect to the seeds of Neomirandea, I am afraid it may
be a little to late. It has been raining a lot in the area.
However, I am planing a trip with Luis to see if we can find
a few of them.

If you go to Panama, please remember Rolandra fruticosa.
I will keep in mind Peteravenia.

Sincerely,

V. Cartho

November 25, 1987

Dr. Victor Castro
Escuela de Química
Universidad de Costa Rica
San Jose
Costa Rica

Dear Victor,

Thanks so much for sending the seed of *Neomirandea*. We are already attempting to grow them. Did you make a voucher?

I am planning a trip to Costa Rica and Panama for early next year. I would like to stop briefly in Costa Rica and make a quick trip up Volcan Turrialba. You may recall that I tried to get to the top when I was there last. I will be traveling alone and would ask that you and perhaps Luis go with me. There are at least 3 more species of *Neomirandea* on the top of Volcan Turrialba. I would like to spend 2-3 days in Costa Rica doing this.

Would it be all right with you if I arrived on the first of January and we went to the Volcan on Jahe next day. After that I will go on to Panama.

In Panama I hope to collect many more species of *Neomirandea*. These would be sent to Boellmann in Berlin for you to work on in March. Of course I will collect other genera and species in Panama. I hope to hear from you soon.

Have a Merry Christmas and a Happy New Year.

Sincerely,


Robert M. King

Department of Botany

December 16, 1987

Dr. Victor Castro
Escuela de Química
Universidad de Costa Rica
San Jose
Costa Rica

Dear Victor,

Thanks so much for your letter. Its is all right that there is no voucher for the Neomirandea collection. However, perhaps you can tell me where you made the collection and the date. We can talk about this when I am there.

My plans now call for me to arrive in San Jose on January 3 at 819 pm on Eastern flight # 911. Would you be able to meet me ? There will only be me. I will be staying in Costa Rica from Jan 3 until Jan 7. This will give me the 4th, 5th and 6th to collect.. I would also like to go to Tapanti Dam again.

I will leave for Panama early on January 7 on Pan Am.

Would you please reserve a small room for me at the Don Carlos hotel.
thanks.

I will try to send a copy of the letter to your home as well.

I wish you a Merry Christma and a Happy New Year.

Sincerely,

Robert M. King

Department of Botany

January 4, 1988

Dr. Victor Castro
Chemistry Department
University of Costa Rica
San Jose, Costa Rica

Dear Victor,

Just a short note to let you know that I have to delay my trip to Costa Rica until sometime in March. I hurt my bad leg the other day and must stay off of it for a while. When do you go to Berlin? I hope that this does not cause you any inconvenience. Please say hello to Luis.

Sincerely,

Robert M. King
Department of Botany

June 5, 1989

Dr. Victor Castro
Escuela de Quimica
Universidad de Costa Rica
San Jose, Costa Rica

Dear Victor,

Enclosed please find some photographs that were taken of you the last time that I was in Costa Rica. I am also sending copies to the Hunt Library.

I would like to plan another collecting trip to Costa Rica and Panama mainly to collect material of Neomirandea. I need to spend most of my time in Panama but would like to visit Costa Rica for a couple of days. I am especially interested in visiting Volcan Turrialba. ~~Since~~ I will be travelling alone, would you be willing to help me by going along with me? Would you be willing to use your pickup truck? The last time that I went to Volcan Turrialba, I was able to drive to the top, near the crater. I would like to visit you in January or February of next year.

I hope to hear from you soon.

Digitized by Hunt Institute for Botanical Documentation

Sincerely,

Robert M. King

Department of Botany

September 21, 1989

Dr. Victor Castro
Escuela de Química
Universidad de Costa Rica
San Jose, Costa Rica

Dear Victor,

Thanks for your letter. I am really looking forward to seeing you again in Costa Rica. I am glad to learn that we will be able to visit Volcan Turrialba. There are many interesting plants that grow only there. I will be especially interested in collecting Neomirandea. My budget is very poor. I will probably stay at a cheap hotel and cut costs whenever I can.

I do not have an exact date right now. I want to come when it is the best for flowers and seed. Probably early next year in February or March. I will have to write to you later when I can arrange things with people in Panama where I hope to go on the same trip.

Sincerely,

Robert M. King

Department of Botany

December 22, 1986

Dr. Haroldo Cavalcante de Lima
Herbario
Jardim Botânico do Rio de Janeiro
Rua Pacheco Leão 915
220800 Rio de Janeiro
Rio de Janeiro, Brasil

Dear Haroldo,

It was good to see you again here in Washington. I hope that your visit was useful to you.

I am writing to tell you that I am planning to be in Rio next January, namely January 24 to Jan. 28 when I leave for São Paulo. I plan to visit your herbarium and also the National Museum. In addition I would like to do some collecting near Rio. I would rent a car for this. Would you have any time to help? Please let me know. In any event I look forward to seeing you again.

Sincerely,

Robert M. King
Department of Botany

Belém(PA), 17 de Novembro de 1980.

Mr. R.M. KING
NATIONAL MUSEUM OF NATURAL HISTORY
Smithsonian Institution
U.S.A.

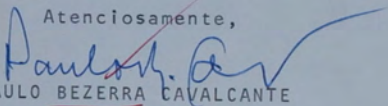
Prezado Senhor

Peço desculpas pela demora em noticiar o recebimento de sua carta de Sept. 30, 1980, devido a muitos compromissos que tive no Amazonas, Manaus.

Agora estou providenciando para enviar-lhe seu pedido de Piqueria esperando que ainda seja útil.

Aqui, tenho somente a coleção P. Cavalcante 2162. A outra coleção que você faz referência deve estar no Jardim Botânico do Rio de Janeiro.

Atenciosamente,



PAULO BEZERRA CAVALCANTE

Pesquisador - MPEG.



CNPq

CONSELHO NACIONAL
DE DESENVOLVIMENTO
CIENTÍFICO E TECNOLÓGICO

Belém(PA), 17 de Dezembro de 1980.

Dr. R.M. KING
SMITHSONIAN INSTITUTION
U.S.Nat Herb.
Washington, DC 20560
U.S.A.

Prezado Dr. King:

Estou muito vaidoso com o gênero Cavalcantia, de sua autoria, em homenagem a este humilde botânico. Meu profundo agradecimento.

Carajás é, na verdade, um interessante repositório de endemismo, provavelmente devido ao seu isolamento, o que teve oportunidade de verificar em 1969. Muitas outras novidades ali encontradas têm despertado a atenção de vários botânicos.

Tão logo possível, verificarei o que ainda temos de Compositae daquela área para enviar a você.

Atenciosamente,

PAULO BEZERRA CAVALCANTE

Pesquisador - M. Goeldi.



INSTITUTO NACIONAL DE PESQUISAS DA AMAZONIA

MUSEU PARAENSE EMÍLIO GOELDI

AV. MAGALHÃES BARATA, 275 - C.P. 299 - FONE: (092) 235-5450 - 235-5700 - CEP 65000 - BELÉM - PA

357-2545

March 17, 1981

Dr. Paulo B. Cavalcante
Museu Goeldi, Cx. Postal 399, 66000
Belem-Para-Brasil

Dear Dr. Cavalcante:

Under separate cover, we have just sent to you the
holotype of Parapiqueria. Many thanks for sending us
this material.

Sincerely,

Robert M. King
Department of Botany

September 24, 1982

Dr. Paulo B. Cavalcante
Museu Goeldi, Cx. Postal 399, 66000
Belem, Para, Brasil

Dear Dr. Cavalcante:

I would like to request that you send me the holotype of the
genus *Parapiqueria*. The specimen will be needed only briefly for
some additional study. Thank you in advance.

Sincerely yours,

Robert M. King
Department of Botany

memorandum

Robinson

DATE: July 27, 1984

REPLY TO:
ATTN OF:

David Challinor

SUBJECT:

Meeting with David Kingsbury

TO:

The Record

At my invitation David Kingsbury joined me for lunch at the Commons on July 24. He is the Assistant Director for Biological, Behavioral and Social Sciences at NSF and is, therefore, the successor to Betsy Clark. He told me that he has already spent considerable time in Washington in various consulting capacities and advised me that his scientific discipline is micro-biology. I found him to be an interesting person, relatively relaxed and quite open about the Institution. I told him that we had about a million dollars worth of grants from NSF now, and explained that they were awarded to the Sorting Center, SERC (through the Chesapeake Research Consortium) and I thought we still had one active with John Falk at SOER. I explained that individual Smithsonian scientists, until 1965, had been able to apply directly to NSF for research grants but in that year Congressman Albert Thomas had inserted language in the NSF appropriations bill that federally paid scientists should no longer be eligible for NSF grants. I pointed out that there seemed to be some discrepancy within NSF on how this statement of Congressman Thomas' should be interpreted. The Division of Biological, Behavioral and Social Sciences under Betsy Clark had very rigidly interpreted this proscription.

He did not indicate specifically whether he would alter the existing policy of this NSF division but in making our departure he said that he felt quite open about working with the Smithsonian. My vibes tell me that we can be more optimistic than we have been in cooperation with NSF. I pointed out the work we were doing in laser disc techniques to apply this technology to assist in collections management. He agreed that such a technique would be enormously helpful to systematic collections which come under his jurisdiction. I offered to organize a demonstration at NASM for him and suggested that NSF might be interested in contributing to the Smithsonian's effort to develop such a collections management tool. He seemed very open and interested.

He told me that in FY 86 the NSF will start to fund proposals to participate in plant germ plasm programs *in situ* instead of in the seed banks the U.S. currently has in Colorado. He thought therefore, that places like BCI, which contain natural areas full of rare and endangered plants, might be eligible for support under this program in FY 86. I mentioned our work on endangered mammals and birds at Front Royal and he also expressed strong interest in visiting there.

cc: Chairman - DMNH
Director - SOSOC
Dr. Skeller

OPTIONAL FORM NO. 10
(REV. 1-80)
GSA FPMR (41 CFR) 101-11.6
5010-114

He told me that the current Assistant Director for the Directorate of Science and Engineering Education at NSF is Bassam Z. Shakhshiri and that this division might indeed be interested in supporting some of our science education projects.

I plan to keep in touch with David Kingsbury and any time we have a specific project I think it would be worth discussing it with him to see whether there are components NSF could fund. This memo is to keep the addressees informed. I do not want to raise any false hopes but I am more optimistic that there is a chance of NSF funding SI projects now than I was 5 years ago.

cc: Bureau Directors, Falk, Ellsworth, Wemmer and Cilella

The conceptual plan of the "Systematics of Haplopappus sections Polyphylla and Xylolapis (Compositae) has much scientific merit. It is the sort of work that is urgently need in the Compositae. The proposal is carefully thought out and is well written.

The budget appears to be adequate for funding this proposal. I doubt, however, if enough money has been budgeted for page charges, etc. The institutional capacity to do this research seems more than adequate.

Judging from Dr. Clark's past record, he is certainly very qualified to carry out the proposed research.

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PRINCIPAL INVESTIGATOR CLARK	W DENNIS	NSF PROGRAM SYSTEMATIC BIOLOGY PROGRAM
TITLE		

SYSTEMATICS OF HAPLOPAPPUS SECTIONS POLYPHYLLA AND
XYLOLEPIS (COMPOSITAE)

COMMENTS (CONTINUE ON ADDITIONAL SHEETS(S) AS NECESSARY):
QUALITY OF THE PROPOSED RESEARCH (INCLUDING BUDGET AND INSTITUTIONAL
CAPABILITY):

The conceptual plan of the "Systematics of Haplopappus sections
Polyphylla and Xylolepis (Compositae) has much scientific merit.
It is the sort of work that is urgently need in the Compositae.
The proposal is carefully thought out and is well written.

The budget appears to be adequate for funding this proposal.
I doubt, however, if enough money has been budgeted for page
charges, etc. The institutional capacity to do this research
seems more than adequate.

RECENT RESEARCH ACHIEVEMENTS OF THE PRINCIPAL INVESTIGATOR(S):

Judging from Dr. Clark's past record, he is certainly very
qualified to carry out the proposed research.

OVERALL RATING: EXCELLENT VERY GOOD GOOD FAIR POOR

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PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

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Arizona State University

ADDRESS OF ORGANIZATION (INCLUDE ZIP CODE)

Tempe, AZ 85281

TITLE OF PROPOSED PROJECT

Systematics of Haplopappus Sections Polyphylla and Xylolepis (Compositae)

REQUESTED AMOUNT

\$66,750

PROPOSED DURATION

24 months

DESIRED STARTING DATE

September 1, 1981

PI/PD DEPARTMENT

Botany & Microbiology

PI/PD ORGANIZATION

Arizona State University

PI/PD PHONE NO.

(602) 965-4482

PI/PD NAME

W. Dennis Clark

SOCIAL SECURITY NO.*

564-70-8853

DATE OF HIGHEST

1977

DEGREE ACHIEVED.

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<i>W. Dennis Clark</i>	<i>H.B. Hunnicutt</i>	<i>Duncan T. Patten</i>
TITLE	TITLE	TITLE
Assistant Professor	Asst. Provost for Research	Chairman
DATE	DATE	DATE
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Arizona State University

ADDRESS (INCLUDE DEPARTMENT)

Department of Botany and Microbiology
Arizona State University
Tempe, AZ 85281

PRINCIPAL INVESTIGATOR(S)

W. Dennis Clark

TITLE OF PROJECT

Systematics of Haplopappus Sections Polyphylla and Xylolepis (Compositae)

TECHNICAL ABSTRACT (LIMIT TO 22 PICA OR 18 ELITE TYPEWRITTEN LINES)

There has been much debate among taxonomists since the 19th century concerning the generic limits of the large genus Haplopappus. The crux of the issue is the relationships of South American species groups which include the type of the genus. Previous studies by the P.I. have supported the segregation of the North American genus most closely related to South American taxa, the genus Hazardia, from Haplopappus sections Haplopappus and Steriphe in Chile. However, the remaining two South American sections, Polyphylla and Xylolepis, have yet to be studied. They may be intermediate between Haplopappus and Hazardia or, as preliminary studies indicate, may best be treated as congeners of Hazardia. Regardless, the generic limits of Haplopappus cannot be determined without comparative studies of Polyphylla and Xylolepis. These studies will include approaches proven successful in previous work: morphology (field and herbarium), chemistry (flavonoids), cytology (chromosome numbers) and palynology (light and scanning electron microscopy).

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ABSTRACT

There has been continuing taxonomic debate among taxonomists since the 19th century concerning the generic limits of the large genus Haplopappus. Despite the extensive systematic information available on North American species of the genus, this debate has only begun to be resolved by recently initiated comparative studies on the true Haplopappus of South America. Thus far these studies have addressed two of the four sections of the genus in South America, sections Haplopappus and Steriphe. Results to date substantiate the congeneric status of these two sections with each other but not with North American groups. However, the as yet unstudied South American sections Polyphylla and Xylolepis appear to be less related to sections Haplopappus and Steriphe than they are to the genus Hazardia in the north. These putative relationships need much further study before they can be confirmed or denied, which is the subject of the proposed study. This project is the second and final study in the systematic investigation of South American Haplopappus. The first step entailed sections Haplopappus and Steriphe. The proposed project will similarly provide morphological, chemical and cytological data on species of Haplopappus sections Polyphylla and Xylolepis. These data will be applied toward monographing these two sections and toward determining their generic affinities. This study will also continue expanding the basis of understanding initiated in the previous study of the chemotaxonomic and cytotoxic relationship between the little known South American members of the

Compositae-Astereae and the extensively studied North American genera of the tribe.

INTRODUCTION

The most recent comprehensive treatment of the genus Haplopappus Cass. included about 150 species in the genus, evenly divided between North America and western South America (Hall, 1928). Subsequent studies of the genus in North America have questioned this treatment, suggesting that at least the North American sections be treated as separate genera or included in existing genera (Clark, 1979; Clark and Mabry, 1978; Hartman, 1976; Keck, 1956; Mayes, 1976; Shinnars, 1950, 1951; Urbatsch and Wussow, 1979). Opposition still exists against these suggestions (Gau, 1976; Jackson, 1966, 1968, 1979; Moran, 1969, 1976). However, the most crucial part of this issue, the relationship between South American Haplopappus, which includes the type species of the genus, and North American Haplopappus has only recently begun to be examined. Present knowledge of the South American species, in addition to Hall's earlier work with specimens in European herbaria, consists of recent systematic studies of sections Haplopappus and Steriphe. Understanding of the entire group in South America cannot be obtained and the continuing disagreement on the generic limits of Haplopappus cannot be resolved, though, until comparative studies are also made of sections Polyphylla and Xylolepis.

Hall (1928) considered Hazardia to be the North American section most closely related to true Haplopappus, since Hazardia

berberidis closely resembles Haplopappus deserticolus of Chile. Additionally, it has been suggested that Hazardia be the only North American taxon included within Haplopappus (Grau, 1976). However, such conclusions are undoubtedly due to the now widely recognized close alliance between Hazardia and Haplopappus section Polyphylla (Brown and Clark, in press; Clark, 1979; Grau, 1976; Hall, 1928; Jackson, 1979). It was pointed out by Hall (1928) and further stressed by Jackson (1979) that certain species of Polyphylla and Hazardia are so similar that, were it not for their disjunct distribution, they would be treated as members of the same group. Furthermore, based upon our recent studies of sections Haplopappus and Steriphe and upon our preliminary examinations of section Polyphylla there is reason to doubt the treatment of Polyphylla in the genus Haplopappus. Moreover, Polyphylla may be more properly treated as a congener of Hazardia. Thus, studies of the relationships of Polyphylla appear to be pivotal to understanding the relationships between both the North and the South American taxa included in the genus Haplopappus by Hall. The proposed project will therefore consist of a systematic study of Polyphylla to shed insight on the generic relationships between large groups of North and South American species in the Astereae, to clearly define the generic limits of the genus Haplopappus, and to provide a modern monographic treatment of the species of Polyphylla. Additionally, section Polyphylla is probably most closely related to section Xylolepis of the South American sections. In fact, preliminary examination of specimens from each of these

two groups reveals no clear and consistent syndrome of characters by which they can be distinguished. Thus, the proposed project will entail the systematic investigation of the 9 species of Xylolepis as well as the 13 species of Polyphylla.

Several avenues of study will be employed toward understanding the systematic relationships of Polyphylla and Xylolepis, each of which has yielded useful information in studying North American groups and other South American taxa: 1) morphology; 2) chemistry; 3) cytology; 4) palynology. Justification of each of these avenues of study, and details for their accomplishments, are discussed under "Proposed Research." In addition, as in previous work on South American taxa, seed samples will be collected for artificial hybridization and cytogenetic studies by Dr. R. C. Jackson of Texas Tech University and stem, leaf and floral tissues will be collected and preserved for anatomical studies by Dr. L. C. Anderson of Florida State University.

OBJECTIVES

Work on all the major and minor objectives will be conducted or directed by the Principal Investigator. The major objectives or goals of the proposed project are two-fold and interrelated:

- 1) To investigate the species relationships within Haplopappus sections Polyphylla and Xylolepis in South America. This will be the second of a two-part systematics study of the genus in South America, the first being of sections Haplopappus (Clark and Brown, in preparation) and Steriphe (Brown and Clark, in review). The proposed project will provide information from several areas

(morphology, chemistry, cytology, palynology) which will form a foundation for monographic treatments of sections Polyphylla and Xylolepis. These monographs will be written by the Principal Investigator.

2) To determine the sectional relationships between the Polyphylla-Xylolepis and Haplopappus-Steriphe alliances and the generic relationships of the former. Cytological similarities among the South American groups (Brown and Clark, in press) and between these and the genus Hazardia (Clark, 1979) may indicate a common ancestry. However, preliminary morphological observations of Polyphylla and Xylolepis indicate a strong divergence from Haplopappus and an alliance with Hazardia. But the taxonomic status of Polyphylla and Xylolepis cannot be judged without more in-depth comparative studies, such as those of the proposed project.

Minor objectives, not directly or immediately applicable to the proposed project but which are relevant to the systematics of Haplopappus and related groups are two-fold:

1) To further provide bases for systematic comparisons between the extensively studied genera of the Compositae-Astereae in North America and the little known, rich assemblages of the tribe in South America.

2) To amass material for study by other haplopappologists in North America, namely Dr. R. C. Jackson of Texas Tech University and Dr. L. C. Anderson of Florida State University. Seed material will be collected for the former and will be used in greenhouse-grown, controlled hybridizations and subsequent cytogenetic analyses. Vegetative and floral material will be collected and

preserved for Dr. Anderson's anatomical studies of Haplopappus and related genera. Previous work by the Principal Investigator in South America has yielded useful material for Jackson and Anderson and the proposed project is also expected to do so.

EXPECTED SIGNIFICANCE

Results of the proposed project will be used to help resolve the disagreement on the generic limits of Haplopappus, which is a problem of concern to many taxonomists. In addition, the proposed studies will add a considerable amount of knowledge to the relatively small amount of information now available on the Compositae-Astereae in South America. These studies will provide a basis for comparisons with our extensive knowledge of North American genera in the tribe, toward an understanding of the evolutionary relationships between large numbers of species in North and South America.

PROPOSED RESEARCH

Information from 4 areas will be integrated in the proposed study which will be completed during the project: morphology, chemistry, cytology, and palynology.

MORPHOLOGY

A. Justification for Morphological Studies

There is no question that morphology provides the initial basis for all taxonomy, as exemplified by major works such as those by Cronquist (1968) and Lawrence (1951). Hall's (1928) treatment of Haplopappus is no exception. However, his treatment

of South American species was based solely upon examination of herbarium specimens and leaves many questions to be answered by a more thorough taxonomic treatment based on field studies as well as herbarium studies. The major issue to be addressed is the extent of variation in South American species as compared to related North American species, and the proper taxonomic treatment of groups of species as congeneric sections or as separate genera. Is the variation continuous between disjunct forms? If not, do discontinuities merit taxonomic recognition at the genus, section, or species level? Major morphological discontinuities between Haplopappus sections Haplopappus/Steriphe and the genus Hazardia justify treatment of the latter as a separate genus (Table 1).

However, the Polyphylla/Xylolepis alliance does not lend itself to immediate judgement at this time, and may represent intermediacy between North and South America (Table 1). Based on preliminary field work and examination of herbarium specimens, including types in Santiago, Polyphylla/Xylolepis may be congeneric with Hazardia and not with Haplopappus. These early indications require much further field work in Chile before their confirmation or denial can be justified.

A number of major questions must also be addressed by morphological studies of the species relationships within Polyphylla/Xylolepis. Delimitation of species using consistent taxonomic characters is most desirable. Hall (1928) produced an exceptional treatment considering the material available to him, but many of his descriptions were incomplete or, as I have since found, in error due to poor or too few specimens. His keys have proven

unworkable for many of the specimens I have examined. Therefore, a dichotomous key to the species of Polyphylla/Xylolepis will also be of prime importance in the proposed project. Thus, the morphological studies will form the foundation of the monographic treatment of Haplopappus sections Polyphylla and Xylolepis which I will write upon the completion of this study.

B. Proposed Itinerary

One South American trip is planned during the proposed project, beginning at Santiago, Chile. The trip will be during the peak flowering time of most of the Polyphylla/Xylolepis species near Santiago and in the drier regions to the north, which is December-January, as judged from examination of herbarium specimens and preliminary field studies on a previous trip to Chile. The estimated time of departure from Phoenix will be mid-December and the trip will take 4 weeks.

The first 2-3 days in Santiago will be used to secure the field vehicle, reestablish personal contacts with Drs. Gloria Montenegro and José Martínez at the Universidad Católica de Chile and Mrs. Mélica Muñoz at the Museo Nacional de Historia Natural, and reexamine the types housed at SGO, which constitute about 90% of the types of R. A. Philippi but which are unavailable for loan. The last 3-4 days will be spent processing and packing herbarium specimens, seed samples, bud vials, other preserved samples, and bulk quantities for chemical study, and preparing them and the proper papers for shipping back to Arizona State University. The intervening 21-23 days in Chile will be spent conducting field work.

Based on previous experience and label data from examined herbarium specimens, the primary field effort will be to the north of Santiago, both along the coast and eastward on into the high Andes. Numerous excursions will be made eastward and westward from Highway 5, which is the major north-south artery in Chile. Additionally, some collecting will be necessary in the vicinity of Santiago and the immediate region to the south.

Numerous herbarium specimens will be collected to obtain as good a record as possible of the extent of morphological variation within and among species. Collections will also include large, bulk quantities for chemical analyses (see section on Chemo-taxonomy), buds for meiotic chromosome counts (see section on Cytology), and specimens for pollen studies (see section on Palynology). Additionally, seeds will be collected for R. C. Jackson and floral and vegetative samples will be collected and preserved for L. C. Anderson. Based on experience in collecting Hazardia in North America and in collecting Haplopappus on a previous extended trip to Chile, such multi-purpose collecting will undoubtedly be a major physical effort. As in all previous field work, assistance will be necessary for obtaining maximum efficiency of the collecting effort and of the subsequent handling of all collected materials. Therefore a student assistant will accompany me during the field work.

CHEMOTAXONOMY

A. Justification for Chemical Studies

The usefulness of flavonoid studies in elucidating biological relationships within and among plant taxa is well recognized.

Such information has been particularly useful in resolving problems involving hybridization (Alston and Turner, 1963; King, 1977), reticulate evolution (Harborne et al., 1973; Levy and Levin, 1975), and taxonomic relationships among families (Harborne and Williams, 1976a), genera (Harborne and Williams, 1976b; Harborne et al., 1976; Williams, 1975), and species (Bierner, 1973; Crawford, 1973). However, flavonoids are not always useful taxonomically. For example, Thermopsis is too uniform, most species producing the same flavonoids (Dement and Mabry, 1972), and Empetrum is too variable, populations of a single species producing different flavonoids (Moore et al., 1970).

There are strong indications that flavonoids will be useful in the systematics of Haplopappus sections Polyphylla and Xylolepis. Related North American groups, such as Hazardia, accumulate a wide variety of flavonoid types in species specific profiles (Clark and Mabry, 1978). Preliminary data on South American Haplopappus have revealed species specific patterns in each of the 4 sections which, upon further study, may show consistent chemical distinctions among the sections as well (Table 2). From these data it seems that South American Haplopappus may be as chemically complex as some of its segregate genera in North America. If proven consistent, this would indicate a primitiveness in comparison to the patterns found in many taxa in the north (Clark et al., 1980a). However, no general pattern is observable without further study.

B. Methods

Flavonoid analyses have been standardized and become

routine since the publication of the manual by Mabry et al. (1970). Additionally, refined separations of similar compounds have become necessary in studying Haplopappus, especially since many of the species of this genus are resinous, which interferes with "clean" flavonoid isolations, and produce flavonoids in low quantities relative to their taxonomically useless caffeic acid esters. The refined separations involve column chromatography using Sephadex LH-20, microcrystalline cellulose, silica gel 60, and polyvinylpolypyrrolidone as adsorbents. Although each plant extract may present new separatory requirements, techniques using such adsorbents have already proven useful in Haplopappus (Brown, 1980; Clark and Brown, unpublished; Ulubelen et al., in press; Oksuz et al., in press; Ayanoglu et al., in review). Thus, previously used standard procedures will, along with recently pioneered separatory methods for Haplopappus flavonoids, provide the basis for chemical studies during the proposed project.

CYTOLOGY

A. Justification for Cytological Studies

Chromosome studies (i.e., chromosome numbers) have been very useful in understanding relationships among genera of the Astereae (Raven et al., 1960; Solbrig et al., 1964, 1969). A continuous series, beginning with $\underline{n} = 2$, has been revealed which is bimodal at $\underline{n} = 4/5$ and, more frequently, $\underline{n} = 9$. Such information, correlated mostly with habit and distributional features, has led the above authors to postulate $\underline{n} = 9$ as the base number for the tribe, which seems reasonable and is generally accepted. An alternative hypothesis is that $\underline{n} = 4/5$ gave rise by amphiploidy

to $\underline{n} = 9$, thereby explaining the relative paucity of $\underline{n} = 6, 7$ and 8 (Turner et al., 1961; Turner and Horne, 1964). However the latter hypothesis has been weakened by the DNA content studies of Stucky and Jackson (1975), who suggested a meroaneuploid reduction from $\underline{n} = 9$ to $\underline{n} = 4/5$. Regardless, the previously mentioned studies are essentially based on North American plants. The base number hypothesis needs considerable testing by expanding cytological studies to South America. Since virtually all of the species of Haplopappus in South America are perennial and shrubby to subshrubby, features considered primitive in the Compositae (Cronquist, 1977), a consistent finding of $\underline{n} = 5$ would tend to weaken the $\underline{n} = 9$ hypothesis. In fact, $\underline{n} = 5$ has invariably been found in those species of South American Haplopappus that have been examined so far (Brown and Clark, in press; Grau, 1976). Two exceptions of $\underline{n} = 6$ include H. prunelloides, which is a doubtful member of the genus (Brown and Clark, in press), and H. scrobiculatus (Turner et al., 1979), which represents a doubtful count. All of the reports to date reflect chromosome numbers found in Hazardia (Clark, 1979).

On a relative scale, species of $\underline{n} = 5$ (i.e., Hazardia) do not reflect the degree of primitiveness that those of $\underline{n} = 9$ do (i.e., Ericameria; Clark et al., 1980a). If the proposed project lends further consistency to this interpretation, then it might be said that taxa in the North American Astereae, subtribe Solidaginae, are more primitive than South American members of this group. Such a growing body of information will then enable further generalizations about the relationships of the North and

South American Astereae as a whole, i.e., relative primitiveness, origins and possible phylogeny.

B. Methods

Flower buds will be collected in the field and immediately fixed in vials containing chloroform, ethanol and acetic acid (5:3:1, v/v). Upon return to the United States these will be transferred to and stored in 70% ethanol until they are counted. Chromosome counts will be made from iron-acetocarmine squashes of microsporocytes in meiosis, a method modified from Beeks (1955) which has been previously successful for Compositae (Brown and Clark, in press).

PALYNOLOGY

A. Justification for Palynological Studies

Detailed pollen studies in the Compositae have proven useful for systematics above the species level (Skvarla and Turner, 1966; Tomb et al., 1974). These studies include both transmission (TEM) and scanning (SEM) electron microscopy. SEM, however, is much faster, allowing for surveys of larger numbers of specimens in a shorter period of time. Data from combined SEM and light microscopy have revealed some systematic trends among sections and segregate genera of Haplopappus (Clark et al., 1980b). However, the South American species are known only from limited material. These data indicate a potential usefulness for understanding generic relationships and the ease, speed and low cost of pollen studies clearly warrant their continuance.

B. Methods

Herbarium specimens collected during the proposed project will provide floral material for pollen studies. These will be the preferred vouchers because they will always be easily at hand for future reference. Borrowed specimens will, with permission from curators, provide additional pollen samples if necessary to round out the survey and to check for possible variation. In addition, nearly 100 pollen samples of Haplopappus and related genera have been collected from specimens in major herbaria by Dr. L. E. Urbatsch of Louisiana State University and will provide a basis for further checking and comparisons with other genera. The dried state of pollen is not a hindrance since it can be rehydrated to full size in 10% KOH within 24 hours. Rehydrated samples will be acetolyzed in acetic anhydride-sulfuric acid (9:1, v/v) for 45 minutes over steam. Acetolyzed pollen reveals more distinct features than unacetolyzed pollen in the SEM and the above procedures have been used successfully in my laboratory. Samples will be mounted onto SEM stubs with silver paint, then coated with gold in a DC sputtering device (Hummer II, Technics Corp.) to enhance conductivity in the electron beam. All SEM work will be conducted with an AMR 1000A (Advanced Metals Research) microscope which is available in our Electron Microscopy Center and which has been previously used by me.

Light microscope studies will involve measurement of pollen size and spine length using a binocular compound microscope and an ocular micrometer. Populations of pollen will be measured for statistical analyses of their variation.

Table 1. Comparison chart for Hazardia and Haplopappus sections
Polyphylla/Xylolepis and Haplopappus/Steriphe (adapted from
 Clark, 1979; Clark and Brown, in preparation; Brown and
 Clark, submitted)

Character	<u>Hazardia</u>	<u>Polyphylla/Xylolepis</u>	<u>Haplopappus/Steriphe</u>
Peduncles	Leafy throughout	Leafy to leafless	Leafless or nearly so
Leaf margins	Dentate to entire	Dentate to entire	Pinnatifid or bipinnatifid
Involucres	Turbinate to campanulate	Obconic	Hemispheric

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Table 2. Examples of completely elucidated flavonoid profiles from South American Haplopappus sections.

Compound	<u>Haplopappus</u> ^a	<u>Steriphe</u> ^b	<u>Polyphylla</u> ^c
scutellarein 6-glc	X		X
isorhamnetin 3-gal			X
isorhamnetin 3-glc			X
apigenin			X
luteolin			X
quercetagetin 3-OMe			X
quercetagetin 3,7-OMe			X
scutellarein 6-OMe	X		
diosmetin	X		
chrysoeriol	X		
myricetin	X		
quercetagetin 3,6,4'-OMe	X		
quercetin 3-gal		X	
vicenin		X	
vitexin		X	
isovitexin		X	

^a From Oksuz et al.; in press

^b From Brown, 1980

^c From Clark, unpublished

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FACILITIES

Morphology: Arizona State University has excellent herbarium and photographic facilities for processing the large number of collected and borrowed specimens and phototypes which will be deposited in ASU during this study.

Chemotaxonomy: My laboratory is well-equipped except for a deficiency in flash evaporators and water circulating baths (see Proposed Budget), to perform the majority of flavonoid analyses anticipated during the proposed project. This includes a number of preparative scale and analytical scale chromatocabs, one low and one high vacuum system with rotary evaporator, and a Beckman 25 Scanning UV-Visible Spectrophotometer. A Waters Model 244 High Performance Liquid Chromatograph, with gradient elution system, is used in my laboratory for some of the flavonoid isolations and the identification of hydrolyzed sugars from flavonoids.

Some structural elucidations may also require NMR and/or MS analyses. Whenever necessary, samples will be derivatized in my laboratory and analyzed in the Department of Chemistry's Spectroscopy Center, which provides spectral analyses free of charge for on-campus research projects.

Cytology: My laboratory contains all the necessary microscope equipment for conducting routine chromosome studies.

Palynology: Light microscopy of pollen will also be conducted in my laboratory. In addition, a fully equipped Electron Microscopy Center in the Department of Botany and Microbiology, directed by J. W. Swafford, will be used for SEM of pollen.

Major items include a Hummer II DC sputtering device and an AMR 1000A scanning electron microscope. All associated photographic facilities are also available in the EM Center.

(SEE INSTRUCTIONS ON
REVERSE BEFORE
COMPLETING)

SUMMARY PROPOSAL BUDGET

22

First Year

ORGANIZATION		FOR NSF USE ONLY			
Arizona State University		PROPOSAL NO.		DURATION (MONTHS)	
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR				Proposed	
W. Dennis Clark		AWARD NO.		Granted	
A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.6. show number in brackets)		NSF FUNDED PERSON MOS	FUNDS REQUESTED BY PROPOSER	FUNDS GRANTED BY NSF (IF DIFFERENT)	
		CAL	ACAD	SUMR	
1	W. Dennis Clark		2	\$ 5,403	\$
2					
3					
4					
5	() OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)				
6	(1) TOTAL SENIOR PERSONNEL (1-5)		2	5,403	
8	OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)				
1	() POST DOCTORAL ASSOCIATES				
2	() OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)				
3	() GRADUATE STUDENTS				
4	(1) UNDERGRADUATE STUDENTS (hourly)			3,840	
5	() SECRETARIAL CLERICAL				
6	() OTHER				
TOTAL SALARIES AND WAGES (A+B)				9,243	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				1,281	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)				10,524	
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$1,000; ITEMS OVER \$10,000 REQUIRE CERTIFICATION)					
\$2,050 Rotary Evaporators (3 ea.)					
2,400 Water Circulating Baths (2 ea.)					
500 Tabletop Centrifuge					
TOTAL PERMANENT EQUIPMENT				4,950	
E. TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS) Bot. Soc. meeting				600	
2. FOREIGN				8,000	
\$3,000 Round trip airfare to Santiago, Chile					
5,000 Per diem, car rental, gasoline, etc.					
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS \$					
2. TRAVEL					
3. SUBSISTENCE					
4. OTHER					
TOTAL PARTICIPANT COSTS					
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				3,500	
2. PUBLICATION COSTS/PAGE CHARGES				300	
3. CONSULTANT SERVICES					
4. COMPUTER (ADPE) SERVICES					
5. SUBCONTRACTS					
6. OTHER Air freight - plant material from Chile				500	
TOTAL OTHER DIRECT COSTS				4,300	
H. TOTAL DIRECT COSTS (A THROUGH G)				28,374	
I. INDIRECT COSTS (SPECIFY)					
On campus, 51% of A-H (less D), or \$23,424					
TOTAL INDIRECT COSTS				11,946	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				40,320	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS GPM 252 AND 253)					
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				\$ 40,320	\$
PI/PD TYPED NAME & SIGNATURE *		DATE	FOR NSF USE ONLY		
			INDIRECT COST RATE VERIFICATION		
INST. REP. TYPED NAME & SIGNATURE *		DATE	Date Checked	Date of Rate Sheet	Initials - DGC
					Program

SUMMARY
PROPOSAL BUDGET

Second Year

23

ORGANIZATION		PROPOSAL NO.		DURATION (MONTHS)	
Arizona State University				Proposed	Granted
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR		AWARD NO.			
W. Dennis Clark					
A. SENIOR PERSONNEL (PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title; A, B, show number in brackets))		NSF FUNDED PERSONS	FUNDS REQUESTED BY PROPOSER	FUNDS GRANTED BY NSF (IF DIFFERENT)	
1. W. Dennis Clark		CAL. ACADS. SUMR	2 \$ 6,214	\$	
2.					
3.					
4.					
5. () OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)					
6. (1) TOTAL SENIOR PERSONNEL (1-5)			2 6,214		
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. () POST DOCTORAL ASSOCIATES					
2. () OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)					
3. () GRADUATE STUDENTS					
4. (1) UNDERGRADUATE STUDENTS (hourly)			4,416		
5. () SECRETARIAL CLERICAL					
6. () OTHER					
TOTAL SALARIES AND WAGES (A+B)			10,630		
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)			1,473		
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)			12,103		
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$1,000; ITEMS OVER \$10,000 REQUIRE CERTIFICATION)					
TOTAL PERMANENT EQUIPMENT					
E. TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS) Bot. Soc. meeting			700		
2. FOREIGN					
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS \$					
2. TRAVEL					
3. SUBSISTENCE					
4. OTHER					
TOTAL PARTICIPANT COSTS					
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES			4,000		
2. PUBLICATION COSTS/PAGE CHARGES			700		
3. CONSULTANT SERVICES					
4. COMPUTER (ADPE) SERVICES					
5. SUBCONTRACTS					
6. OTHER					
TOTAL OTHER DIRECT COSTS			4,700		
H. TOTAL DIRECT COSTS (A THROUGH G)			17,503		
I. INDIRECT COSTS (SPECIFY)					
On campus, 51% of A-H (less D), or \$17,503					
TOTAL INDIRECT COSTS			8,927		
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)			26,430		
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS GPM 252 AND 253)					
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)			\$ 26,430	\$	
PI/PD TYPED NAME & SIGNATURE*		DATE	FOR NSF USE ONLY		
INST. REP. TYPED NAME & SIGNATURE*		DATE	INDIRECT COST RATE VERIFICATION		
			Date Checked	Date of Rate Sheet	Initials DGC
			Program		

BUDGET JUSTIFICATION

A. Salaries and Wages

1. Principal Investigator, W. Dennis Clark

Dr. Clark is requesting 2/9 of his academic year salary for the summer months during the tenure of the proposed project. He will supervise the project throughout each year, conducting the field work and performing or directing all morphological, chemical, cytological and palynological studies.

2. Student Field and Laboratory Assistant (1)

A request is made to hire a student, at an hourly rate, for approximately 20 hours per week to assist in processing herbarium specimens, in preparing pollen samples for SEM, in conducting routine paper, column and thin-layer chromatographic procedures and in performing day to day laboratory clean-up. The student assistant will also assist the P.I. during the field trip to Chile. (For further justification of field assistance, see Proposed Research - Itinerary.)

B. Permanent Equipment

The relatively minor items of capital equipment requested for the proposed project will alleviate the daily bottlenecks and productivity-limiting effects attributable to the paucity of currently available equipment. The number of evaporators in my lab is insufficient for the amount of work that is currently being done and that is anticipated during the proposed project.

There are no water circulating baths for permanent use at this time - the one in use now is on loan from another faculty member's laboratory.

A request is also made for a tabletop centrifuge to be used primarily in palynological studies. There is no useful and consistently available centrifuge for such work in the department.

C. Expendable Supplies

The majority of expendables for both years of the proposed project will be solvents and adsorbents for large scale preparative column chromatography. Glassware, other chromatographic supplies (paper, TLC), photographic and collecting supplies for the field trip, herbarium mounting materials and cytological and palynological supplies will constitute the remainder of these expenses.

D. Travel

1. Domestic travel will include one trip each year to the annual meeting of the Botanical Society of America. Papers will be presented at each of these meetings based on the results of the proposed project.
2. Foreign travel will entail one collecting trip to Chile near the beginning of the first year of the proposed project, during December 1981 and January 1982. The work will include extensive collecting of Polyphylla and Xylolepis species, including duplicate specimens for distribution and for palynological studies, bulk samples

for preparative flavonoid chemistry, buds for chromosome counts, seeds for R. C. Jackson and preserved anatomical material for L. C. Anderson. The extent of the effort in organizing the trip in the Fall of 1981, conducting the work in the field and handling the collected materials upon return to the U.S. will be considerable and therefore wages (see Salaries and Wages) and travel expenses are requested for an assistant as well. Based on past experience, great efficiency and economy in such work is realized by having such an assistant. The work could not be completed in the time allotted without one.

E. Publication Costs

A large number of pages will be published based on the results of the proposed project, beginning with short chemically and cytologically oriented papers and ending with a monograph of Haplopappus sections Polyphylla and Xylolepis. The requested funds will be used for page charges, reprints and artwork supplies and for preparation of figures and photographic costs related to publication.

F. Other Costs

A request is made to pay anticipated air freight charges for shipping bulk collections and herbarium specimens from Chile to Arizona.

CURRENT AND PENDING SUPPORT

This proposal has not been submitted to any other agency for funding. The P.I. has no funds for other support during the proposed project period. There are no other pending applications by the P.I.

W. DENNIS CLARK

Personal Data

Address: Office - Department of Botany and Microbiology
Arizona State University
Tempe, AZ 85281
Phone - (602) 965-4482
Home - 1033 S. Mariana Apt. 1
Tempe, AZ 85281

Date and Place of Birth: January 20, 1948; Redding, California

Marital Status: Married to Lisa E. Tan, 1981

Education

Ph.D. in Botany, 1977, University of Texas at Austin
B.A. in Biology, 1970, California State University at Sacramento

Professional Experience

Assistant Professor of Botany, Arizona State University,
1976-present
Assistant Instructor, University of Texas, 1975-76
Teaching Assistant, University of Texas, 1972-75
Welch Foundation Summer Research Fellow, University of Texas,
1973-76
Assistant Herbarium Curator, California State University at
Sacramento, 1971-72
Graduate Assistant, California State University at Sacramento,
1970-71
Research Assistant, California State University at Sacramento,
1969-71

Memberships in Professional Societies

American Society of Pharmacognosy
American Society of Plant Taxonomists
Arizona-Nevada Academy of Sciences
Botanical Society of America
California Botanical Society
Ecological Society of America
Faculty Association, Arizona State University
International Association for Plant Taxonomy
Phytochemical Society of North America
Society for the Study of Evolution

Elective Offices Held

Treasurer, Phytochemical Section, Botanical Society of America,
1981-82
Admissions Committee, Society of Sigma Xi, 1980-82

Honors

Phi Kappa Phi
Sigma Xi
American Men & Women of Science
H.C. Bold Teaching Award, University of Texas

Research Interests

- A. Chemistry and systematics of Haplopappus (Compositae) and related genera
- B. Chemical ecology and chemotaxonomy of Opuntia and other Cactaceae

Research Support

National Science Foundation, 1975. "Systematics of South American Haplopappus (Compositae-Astereae)." \$911.

Arizona State University Research Assistantship for a graduate student, 1977. "Flavonoids of Opuntia (Cactaceae)."

Arizona State University Grant-in-Aid, 1977. "Chemotaxonomy of Isocoma (Compositae)." \$2,600.

Arizona State University Grant-in-Aid, 1978. "Chemotaxonomy of Hesperodoria." \$3,200.

Arizona State University Grant-in-Aid, 1979. "Phytochemical Studies by High Performance Liquid Chromatography." \$3,100.

National Science Foundation, 1979-80. "Systematics of Haplopappus Section Haplopappus (Compositae)." \$50,618.

Arizona State University Research Enrichment Grant, 1980. "Chemical and Chromosomal Variation in Cholla Species and Hybrids." \$965 (with Prof. D. J. Pinkava)

Arizona State University, Liberal Arts College Summer Salary Award for Research, 1980. "Natural Defenses of Cacti Against Their Insect Pests."

Arizona State University Research Assistantship for a graduate student, 1980-81. "Chemical and Chromosomal Variation in Cholla Species and Hybrids." (with Prof. D. J. Pinkava).

Grand Canyon Natural History Association, 1980. "Predation and Plant Life History Characteristics." \$210 (with G.A. Ruffner).

Invited Lectures

Department of Developmental and Cell Biology, University of California at Irvine
 Department of Botany, Phytochemical Section, University of Texas
 Department of Biology, Northern Arizona University

National Services

Meeting Session Chairman, Botanical Society of America, 1979, 1980

Organizer, HPLC Workshop, Botanical Society of America, 1980

Review manuscripts for : American Journal of Botany
 Southwestern Naturalist
 Botanical Gazette
 Systematic Botany
 Madrono
 Evolution

Review grant proposals for the National Science Foundation

Review book manuscripts for: West Publishing Company
 Glencoe Publishing Company
 Moseby Publishing Company
 Worth Publishing Company
 Wadsworth Publishing Company

Editor, Phytochemical Bulletin (Phytochemical Section, Botanical Society of America), 1981-82.

Publications

Abstracts of Presented Papers

A scanning electron microscope study of Haplopappus pollen.
 W.D. Clark, R.A. Mayes and T.J. Mabry. Amer. J. Bot. 61 (5, Suppl.): 41. 1974.

Investigations of North-South American disjuncts in Parthenium (Compositae). E. Rodriguez, W.D. Clark and T.J. Mabry. Abstracts of Papers, Annual Meeting of the Phytochemical Society of North America, p. 8. 1974.

The relationship of Haplopappus section Hazardia (Asteraceae). W.D. Clark. Abstracts of Papers, Annual Meeting of the Botanical Society of America, p. 52. 1975.

Chemosystematics of the genus Hazardia. W.D. Clark. J. Ariz. Acad. Sci. 12 (Suppl.): 16. 1977.

Cytological and chemical evidence for the origin of Hymenothrix loomisii Blake (Compositae). W.D. Clark, D.J. Keil and D.J. Pinkava. Bot. Soc. Amer. Misc. Ser. Publ. 156: 50. 1978.

Possible origin of Opuntia curvospina (Cactaceae). B.D. Parfitt and W.D. Clark. J. Arizona-Nevada Acad. Sci. 13(Suppl.): 23-24. 1978.

Pugnacious ants and the buckhorn cholla. C.H. Pickett and W.D. Clark. Bull. Ecol. Soc. Amer. 59: 108. 1978.

Problems concerning the use of involucre shape as a taxonomic character in South American Haplopappus (Compositae). W.D. Clark and G.K. Brown. Bot. Soc. Amer. Misc. Ser. Publ. 157: 52. 1979.

The flavonoids of developing cotton seeds. J.A. Miernyk and W.D. Clark. Abstracts of Papers, Annual Meeting of the Phytochemical Society of North America. 1979.

Journal Articles

Systematic implications of flavonoids in Hazardia. W.D. Clark and T.J. Mabry. Biochem. Syst. Ecol. 6: 19-20. 1978.

The taxonomy of Hazardia (Compositae-Astereae). W.D. Clark. Madroño 26: 105-127. 1979.

The function of extrafloral nectaries in Opuntia acanthocarpa (Cactaceae). C.H. Pickett and W.D. Clark. Amer. J. Bot. 66: 618-625. 1979.

IOBP Chromosome Number Reports LXV, Compositae. G.K. Brown and W.D. Clark. Taxon 28: 635. 1979.

Uses of high performance liquid chromatography in phytochemical studies. W.D. Clark and G.K. Brown. Phytochem. Bull. 13: 2-23. 1980.

Flower flavonoids of Opuntia series Opuntiae. W.D. Clark and B.D. Parfitt. Phytochemistry 19: 1856-1857. 1980.

Pollen morphology of Haplopappus and related genera. W.D. Clark, G.K. Brown and R.A. Mayes. Amer. J. Bot. 67: 1391-1393. 1980.

Systematic implications of flavonoid patterns in Haplopappus segregates. W.D. Clark, L.E. Urbatsch, R.L. Hartman, R.A. Mayes and T.J. Mabry. Biochem. Syst. Ecol. 8: 257-259. 1980.

Flavonoids of Opuntia subgenus Cylindropuntia. W.D. Clark, G.K. Brown and R.L. Mays. Phytochemistry 19: 2042-2043. 1980.

Effects of long-term field sulfur dioxide fumigation on Arctic caribou forage lichens. T.J. Moser, T.J. Nash III and W.D. Clark.

Can. J. Bot. 58: 2235-2240. 1980.

High performance liquid chromatographic identification of flavonoid mono- and disaccharides. W.D. Clark. Phytochemical Bull. (In Press).

Chromosome numbers in South American Haplopappus Cass. (Compositae). G.K. Brown and W.D. Clark. Amer. J. Bot. (In Press).

Flavonoids of Haplopappus rengifoanus Remy. A. Ulubelen, W.D. Clark, G.K. Brown and T.J. Mabry. J. Natural Products (In Press).

Recovering polymerized fossil palynomorph residues. J.D. Shane and W.D. Clark. Micropaleontology (In Press).

Flavonoids from Haplopappus foliosus (Compositae). A. Ulubelen, E. Ayanoglu, W.D. Clark, G.K. Brown and T.J. Mabry. J. Natural Products (In Press).

Flavonoids of Haplopappus canescens. S. Oksuz, A. Ulubelen, W.D. Clark, G.K. Brown and T.J. Mabry. Rev. Latinamer. (In Press).

Manuscripts Submitted

Taxonomy of Haplopappus section Steriphe (Compositae). G.K. Brown and W.D. Clark. Systematic Botany (In Review).

Quercetin and myricetin methyl ethers from Haplopappus integerrimus var. punctatus. E. Ayanoglu, A. Ulubelen, W.D. Clark, G.K. Brown, R.R. Kerr and T.J. Mabry. Phytochemistry (In Review).

357-2545

March 27, 1981

Dr. T. Clifford
Botany Department
University of Queensland
St. Lucia 3067, Brisbane
Queensland, Australia

Dear Dr. Clifford:

Mrs. Nell Stevens of your Department, has suggested that I write to you regarding my forthcoming trip to Australia.

I plan to attend the International Botanical Congress in Sydney in late August. I would like to visit Brisbane about ten days prior to the Congress and make collections of Compositae. My interest is with only the endemic genera and species. I would like to make some biochemical and cytological studies of them.

My request is this: Do you have facilities that I could use to dry plants? Would there be anyone (perhaps a graduate student) that could help with localities for Compositae? Any help that you can give will be appreciated.

Very sincerely,

Robert M. King
Department of Botany

357-2545

April 15, 1981

Dr. H. T. Clifford
University of Queensland
Department of Botany
St. Lucia, Queensland,
Australia, 4067

Dear Dr. Clifford:

Thanks for your letter. I appreciate your advice
and I have already written to Dr. Johnson, as you
suggested.

Sincerely,

Robert M. King
Department of Botany



COMMONWEALTH INSTITUTE OF BIOLOGICAL CONTROL

West Indian Station: Gordon Street, Curepe, Trinidad, W.I.

Telephone: 662-4173

Cables: BIOCONTROL, Trinidad.

DIRECTOR:
ASST. DIRECTOR:

F. D. BENNETT, B.S.A., Ph. D.
D. J. GREATHEAD, B.Sc. ARCS., Ph.D., F.I. BIOL.

OUR REF:
YOUR REF:

July 28, 1981

Drs. R. King and/or H. Robinson
The National Museum of Natural History
Smithsonian Institute
Washington D.C., USA

Dear Dr. King/Dr. Robinson:

re: Taxonomy & Ecology of Eupatorium (sensu lato) spp.

I am currently co-preparing a review of the biological control work on Chromolaena odorata L. using the Arctiid moth Pareuchaetes pseudoinsulata. As part of the research on this moth, the suitability of various plants as larval foodplants was tested.

As an entomologist, I find it difficult enough to keep track of the insect name changes (P. pseudoinsulata was, until recently, known as Amalio insulata) and so seek your help with respect to your revisions of the Compositae. I would be grateful if you could tell me the current taxonomic status of the following species formerly in the genus Eupatorium: - azureum DC, havanense HBK, macrophyllum, inulifolium, laevigatum, pynocephalum, microstemon, ivifolium, hookeriana.

Can you give me any indication of species grouping within this list? On the basis of the feeding tests, azureum, odorata, microstemon and ivifolium form one unit, inulifolium, laevigatum and pynocephalum are quite closely related to it but not necessarily to each other while macrophyllum and havanense HBK are rather more distantly related - i.e. the larvae of P. pseudoinsulata develop, partially develop or do not develop at all in the three groups respectively. Do you see any taxonomic correlation to this grouping?

The other topic on which I would welcome information or opinion is the natural ecology of C. odorata. Clearly at the moment C. odorata is an early successional, found in abandoned fields and pastures, on building sites and along roads, railways and streams.

2/....

What was its niche before the advent of man when it and the moth co-evolved? Presumably, it was to be found on the edge of savannahs, in clearings caused by landslips and falling trees etc. Our suggestion is that it was particularly associated with riverine systems and their meanders. The distribution of the various species of Pareuchaetes offer support for this - individual species or subspecies each being restricted to an estuarine basin. In the Caribbean, could C. odorata be a seashore species (my own observations in Trinidad do not support this) or indeed a recent adventive following ⁿ disturbance of the ecosystems.

I would appreciate any information or views you have regarding the natural habitat of C. odorata.

Copies of relevant reprints including 1970 Chromolaena Phytologia 20(3): 204 would be gratefully received.

With my thanks for any assistance you can render to me.

Yours sincerely,

Matthews

M.J.W. Cock
Entomologist in Charge

MJWC:adj

357-2545

February 9, 1982

Dr. Leo Collins
Box 629
Norris, Tennessee 37828

Dear Leo:

I hope that you had a good trip from Miami to Norris.
Needless to say I was glad to get home. I continue to have
headaches and am still under the care of a physician.

If you still have some bills that I need to reimburse you
for, please send me ~~the~~ receipts.

Enclosed is a franked label that you may use to send me the
film for duplicating.

Hope that all is well with you.

Sincerely yours,

Robert M. King
Department of Botany

(Leo Collins)

J.L.C.
NORRIS, TN
15 Mar. 1987

Dr. Robert King
Department of Botany
Smithsonian Institution
Washington, DC 20560

Dear Bob:

The UNREIMBURSED bills are a trifle and should be forgotten.

I am sending the slides under separate cover. Copy any you want. I only ask that, if the slides are removed from their mounts during copying, they be returned to the proper mounts or, if these are ruined, the proper captions be transcribed from the old mounts to the new.

The remaining slides are not available presently. I will send them later, when this first set is finished.

Enclosed is the recipe I promised. I recommend it highly.

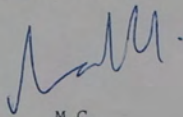
Sincerely,

Leo

4 April 1984

Bob--

I picked up this letter when I was visiting Allen Press recently, and I thought you might like to see some of the preliminary thoughts Allen Press has had concerning production of the Eupatorieae. I am glad to see that they are thinking about keys and I would hope that we could begin your long keys on new pages and then reset as necessary in order to keep them from moving too far toward the right margin. As far as type sizes go, I think 10 pt. leaded 2 pts. is too much leading based on the sample fish book they gave me. Ten on 1 might be better. At any rate, we will continue to develop these parameters and keep you posted.



M.C.

Marshall R. Crosby

Missouri Botanical Garden

P.O. Box 299
St. Louis, Missouri 63166
U.S.A.



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March 30, 1984

Marshall Crosby
Missouri Botanical Garden
P. O. Box 299
St. Louis, MO 63166

Dear Marshall:

Arly asked me to respond to your letter of February 24 in regard to the manuscript index of the Eupatorieae. I did want to take a chance to have some of our people here go over the materials you submitted with your letter so that we could give you our best advice on this manuscript.

I agree with you that it would be good to produce this in a size of 8½" x 11." This is a standard size for printing and would work well for this type of material. We are also able to print books in a size of 9" x 12" with about equivalent efficiency to the 8½" x 11" size, since our presses are large enough to print 16 page units in either size. If you really want to produce an elegant coffeetable type of book, you might wish to consider the 9" x 12" size rather than the 8½" x 11."

I am enclosing a copy of a clothbound book, Fishes of the Western North Atlantic, which we recently produced for the Sears Foundation for Marine Research. As you can see, this book is quite elegant with wide margins and large typesize and, of course, is also quite expensive. A number of variations on this format would be possible using different typesizes and formats for better efficiency in terms of the amount of material on each page that can give you an elegant look with fairly reasonable cost.

If you do go with a two column format for the bulk of the book, I would suggest using 10 pt. type with 2 pts. of leading and a line length of about 20 picas. The reduced type could be 9/11 or perhaps 8/10, although in the large format you are considering for this series the 8 pt. typesize can be somewhat difficult to read. The Sears Foundation book is set in an 11 pt. text size which makes it easier to read but does add to the number of pages necessary to produce a given amount of material.

If you go with three columns for the species listings you could certainly use a smaller type size. I would recommend 9/11 for this material which should work out very well.

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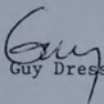
Marshall Crosby
March 30, 1984
Page 2

With regard to the keys, I would suggest that we consider using the full text page width. We can set the keys with up to about 14 levels of indent and this should allow us to produce the key nicely. If it does not, we could reset part of the key later. This is much more expensive, but really the same cost as starting the key over on each page. Either way requires double typesetting.

Finally, I agree with you that it would be difficult to come up with any kind of a meaningful cost estimate at this time, since we do not have the full manuscript in hand in order to determine how many pages might appear in this book. Probably what we should do at this point is attempt to pin down the exact format you think you would like to use for the book, and then take a look at the whole manuscript when it is ready to determine the number of pages and work up a quotation.

The other items we would need to know are the pressrun for this series, the kind of paper and binding that you wish to use, and whether we would be responsible for any kind of distribution or simply shipping books to you at the Garden. If you can give us this information at a later date, we would be glad to work up a quotation for you. I look forward to further discussions about this manuscript.

Cordially yours,


Guy Dresser

GD/lrs

Encl

P.S. You mentioned in your letter of March 13 that you are awaiting the quotation on this article by King and Robinson and also on the Rodin manuscript that you recently submitted for Systematic Botany Monographs. We did quote you on the Rodin manuscript in our letter of March 15, 1984. In the event you did not receive that letter I am enclosing a copy.

December 14, 1985

Dr. Marshall R. Crosby
Director of Research
Missouri Botanical Garden
P. O. Box 299
St. Louis , Missouri 63166-0299

Dear Marshall:

Thanks for your letter and the samples. Our choice is Roxite C 56644 Vellum Finish. I think that would go nicely with gold lettering. We have decided to use our first names on the cover and title pages. It should be Robert M. King and Harold Robinson. Also I just wanted to remind you to repeat the illustration on the cover to the title page as well.

I do hope that the proof gets here soon. Both of us will be out of the country in February.

Sincerely yours,
Robert M. King
Department of Botany

December 23, 1985

Dr. Marshall R. Crosby
Director of Research
Missouri Botanical Garden
St. Louis, Missouri 63166-0299

Dear Marshall:

Just a short note to let you know that the nomenclator printout has arrived and that I am hard at work on it.

I have changed my mind about the cover of the book. Instead of the blue, I would like to have it as a Chinese Red. I think that would be very elegant with gold print. Sorry for any trouble.
le.

Digitized by Hunt Institute for Botanical Documentation

Sincerely,

Robert M. King
Department of Botany

January 8, 1986

Dr. Marshall R. Crosby, Director of Research
Box 299
Missouri Botanical Garden
St. Louis, Missouri 63166-0299

Dear Marshall,

Just a short note to let you know that I called Ken Blair at Allen Press to let him know of the change of color for the cover of the Eupatorieae. Apparently my letter to you about did not arrive. Anyway, the color that we want is red #56502 with gold printing.

Sincerely yours,

Robert M. King
Department of Botany

Digitized by Hunt Institute for Botanical Documentation

July 9, 1986

Dr. Marshall Crosby
Missouri Botanical Garden
St. Louis, Missouri 63166-0299

Dear Marshall,

Enclosed here is a mockup of what I would suggest for the title page. I believe that you have the original of these drawings.

Harold has finished the proof reading and will be sending you the material under separate cover. I hope that the proof of the plates and page proof can be sent soon.

With kind regards,

Sincerely,

Robert M. King

Department of Botany

March 19, 1987

Dr. Marshall R. Crosby
P.O. Box 299
Missouri Botanical Garden
St. Louis, Missouri 63166-0299

Dear Marshall,

I am writing to request that you send us the copy of the galley proof that we indicated our corrections on. This will greatly help us with the page proof.

Enclosed are some mailing franks that you may use to send us the proof.

Sincerely,



Robert M. King

March 31, 1987

Dr. Marshall R. Crosby
P. O. Box 299
Missouri Botanical Garden
St. Louis, Missouri 63166-0299

Dear Marshall,

Enclosed please find dedication that Harold and I have agreed on for the book. It would be nice if it could be on a separate page. No doubt that we will be talking about it.

Sincerely,



Robert M. King

This volume is dedicated to the three most important and able
synantherologists of the 20th Century in North America, Benjamin Lincoln
Robinson, Sidney Fay Blake, and Jose Cuatrecasas.

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Cali, junio 6 de 1.983

Dr. José Cuatrecasas.
National Museum of Natural History.
Smithsonian Institution. Botany NHB #166.
Washington, D.C. 20560.

0122

Estimado Pepe:

Contesto sin demora su carta del 28 de mayo.

Por fin parece que vendrá en este mes, por una semana, la señora Meggers. Voy a ver si ella lleva a su regreso las Cespedesias que van para la Smithsonian.

Desde luego, no hay dificultad para que el Dr. King pueda venir a trabajar por una temporada, aun en el caso de que yo no continúe en el cargo.

Se le puede suministrar un vehículo, y aun alojarlo a él en una habitación en el museo, a precios muy módicos (unos 6 dólares diarios). El carro vale cerca de 20 dólares diarios; pero se puede hacer un arreglo especial, si el Dr. King deja duplicados de las colecciones que haga. Tampoco hay dificultad alguna para que lo acompañe el biólogo Devia. Tendría también facilidades para secar y procesar las plantas, pues ya está para terminarse el laboratorio de Botánica de Mateguadua, obra a la cual le he dedicado los últimos tres años. Cuando se aloje en Mateguadua o en alguno de los otros centros distintos de Cali, no se le cobrará nada por la dormida. Pueden, pues, hacer planes para este viaje. La casa de la Smithsonian ya no funciona en Cali; todo fue transferido al Museo.

En cuanto a mí, sigo mejor y no he vuelto a tener problemas de salud; pero me tengo que cuidar.

Le retomo los saludos, lo mismo de los de mi casa e Inés. Vivo preocupado por la salud de ustedes; pero ojalá vayan pasando sin muchos achaques.

Abrazos,

P.S.

Le agradecería conseguirme un ejemplar o fotocopia del siguiente trabajo:
FORD, R.I. (editor): 1978. The Nature and Status of Ethnobotany. Antropol.
pap. No.67. Mus. Anthropol. Univ. Michigan, Ann Arbor, MI.

C. Archivo visitantes.

vmp/ic.