

**MAYA MOUNTAIN TRAVERSE EXPEDITION,  
JANUARY 16 - FEBRUARY 4, 1995.**

**BIOLOGICAL REPORT**

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**Maya Mountain Traverse Expedition, January 16 - February 4, 1995**  
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### **Team:**

Jim Allan, Vancouver, Canada: Team leader.

Jim van Dijk, Vancouver, Canada: Film team.

Dick Hamilton, Vancouver, Canada: Film team.

Guy Robinson, Vancouver, Canada: Film team.

Larry Rice, Lacon, Illinois, USA: Reporter.

John Field, Downers Grove, Illinois, USA: Donor

Gerald Williams, Daytona Beach, Florida, USA: Photography

Jan Meerman, Cayo district, Belize: Biologist.

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Albert Jones, Dangriga, Stann Creek district: Guide.

Orlando de la Oh, San Jose Socoths, Cayo district, Belize: Guide.

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### **Goals of the expedition:**

Main purpose of the expedition was to explore a part of Belize where virtually no one ever comes. For several team members the rationale was to document an expedition into a remote and little known region of the world. Others looked upon this expedition as an opportunity to document the poorly known flora and fauna of this part of Belize. Again others mainly wanted to make sure everything went well on the trip but for all team members one of the main attraction was the physical and mental challenge this trip offered.

As far as we know there have been no general biological expeditions into the areas visited by the team. Highest Point (1124m), just 3.5 km south west of the Highest Point reached by the expedition has received some attention and has been relatively well documented. (Meadows, 1988.; Anon., 1989.; Anon., 1992). These three reports served as important background information in planning the scientific part of the expedition. None of the reports mentioned above addressed in any depth the entomological section of the fauna of the area. Since the senior author is preparing a publication on the Butterflies of Belize, one of the main goals of the current expedition, therefore, became to document the butterfly fauna of these unexplored reaches of Belize.



### **Organizational aspects of the expedition:**

From the beginning on the route of the expedition was more or less clear. We planned to start walking somewhere along the upper Chiquibul river, travel towards Highest Point, descent into the Snake Creek, from there move over to the Bladen and finally end at the entrance of the Bladen Nature Reserve (Map 1). Using the vast experience of team leader Jim Allan, the expedition was estimated to take 3 full weeks. All food for these three weeks needed to be carried along since there were no locations along the route where extra provisions could be acquired. Most food was air dried and prepared well in advance of the trip. With 15 team members and an estimated duration of 3 weeks, this meant 315 man days of food! Packing the food and dividing it over the team members was a major organizational task (Fig. 1).

Safety was of major concern during the expedition. Team leader Jim Allan received intensive Jungle first aid training but preferred not to use this knowledge. Also the chances for being air lifted out in case of emergencies was minimal so the emphasis was on preventing casualties. Nevertheless, an extensive first aid kit was a vital component of the equipment. A portable two way radio was our main contact with the outside world. Not so much that we needed to know what was going on but mainly to keep our loved ones at home informed on our whereabouts. To know our whereabouts, the team leader carried a Trimble Ensign GPS along. A GPS does not function well under the forest canopy but nearly every day we managed to find at least one natural treegap large enough to get a bearing.

A walking stick was a very handy instrument and assisted in keeping balance on slippery stones, steep slopes and for testing the depth of the streams we were wading through. Since everyone was carrying backpacks varying in weight from 25 - 50 kg, keeping balance was not always easy.

En route we followed a certain routine, designed for maximum safety. The team leader and one of the guides walked ahead, scouting where to go. Another guide moved somewhere in the middle of the line of people while the third guide followed in the rear. Every hour we stopped so slow movers could catch up again and every one could have a short rest. Sometimes the team leader together with one of more guides went ahead to scout a possible route. The rest of the team had then to wait until a passable route had been found. During a lunch break, everyone was encouraged to take off his footwear and expose his feet to clean air, in this way hoping to prevent fungal infections as long as possible.

Fortunately we had no major accidents during the trip. People fell, sometimes hurting themselves painfully but no one broke any bones. Everyone sooner or later grabbed into the spines of Give-and-take or Warrie Cohune. The record



length of a spine retrieved from someone's hand was 2.0 cm! Definitely dangerous were unexpected deep spots in the streams. The heavy backpacks were water proof to allow immersion in exactly such holes but they floated like a cork on your back and prevented you from getting your head above the water. Not to panic was very important in this case.

Expeditions like these are not complete without stories about narrow escapes from aggressive snakes, spiders or scorpions. Unfortunately such stories can not be included in this report because such events never occurred. During the three weeks of the expedition the 15 team members together saw no more than 4 snakes. Two of which were completely harmless, while the other two were coral snakes but too small to be of any real danger. Jaguars and/or Puma's were around because we found their tracks but they never showed themselves and so never provided any exciting bedside stories.

We did meet some unpleasant animals though. Mosquito's (Culicidae) were always present but usually in very low numbers. Since we traveled through uninhabited areas there was no fear for malaria. Unfortunately some team members contracted malaria immediately after we returned into human inhabited areas again. The main reason why most of us chose to sleep under a mosquito net was the fear to get bitten by Leishmaniasis transmitting *Phlebotomus* sandflies. Every now and then some one discovered a tick somewhere on his body but ticks were never considered a problem until we reached "Tick Camp". This was probably the worst experience most team members had on this trip. Since we followed streams, Black Flies or "Botl'ass" Flies (*Simulium sp.*) were very much in evidence. Their bite caused a glowing itch, most noticeable on knuckles, elbows, feet and ears. Some team members were also severely bothered by "chiggers", a mite burrowing under your skin and again causing an uncontrollable itch.

In general the entire team was very fortunate in avoiding accidents. The only bandage used in large quantities was "Mole-skin" which was very effective in protecting sore/open spots caused by constant rubbing of the heavy back packs.

We planned to follow streams as much as possible. Streams are most convenient causeways. You don't need to cut a trail and if you follow a stream - upstream, sooner or later you end up on the divide. By moving downstream you walk away from the divide and sooner or later you have to cross the Southern Highway. At least this was the theory. The truth proved to be quite a bit more complicated as we were to find out in the Snake Creek and Upper Bladen. Also following a stream is not always as easy as it may seem. Rocks are slippery and/or wobbly, so you have to move slowly and carefully. Giant trees may have fallen over the stream, climbing over or under one of these giants with a heavy back pack on, is an awkward exercise. If not the bole, but the crown is blocking the stream, getting through is only possible after some intensive machete work.



Traveling around them was generally easier. Waterfalls were beautiful but also a major obstacle. Most of the times we decided to try to travel around them, but this involved climbing across steep slopes and ridges clinging onto trees and lianas for sheer survival, and testing with your feet any rock or root that might give some foothold. Again, the heavy back packs were not a big help in these situations.

The steep hills and ridge sides were very difficult to travel along, but the forest as such was generally easy to travel through. Most of the time, the forest was really high, the canopy closed and the understory very open. Actually cutting a trail with a machete was in most cases not really necessary. Only in cases of large tree gaps with dense secondary growth, passage was severely obstructed.

All in all, traveling was slow and although we usually had the feeling we traveled vast distances, we rarely made more than a few kilometers every day.

The members of the film team had their specific worries. Apart from having to carry around heavy cameras, they also needed large numbers of batteries for their equipment. Since it was impossible to carry all batteries needed for the entire duration of the trip, the film team used small solar panels to recharge the batteries. Unfortunately for them, we experienced quite a few cloudy days and more importantly, we traveled most of the time under closed canopy. Finding a sunny spot, no matter how small, during lunch and other breaks was, therefore, one of the first priorities all along on the trip.

To save weight, we didn't carry tents. Instead we had a set of large tarpaulins. One tarpaulin served as floor, while another tarpaulin was stretched over a rope to serve as roof in case of rain. Small inflatable mattresses and sleeping bags served as individual beds. Most team members also preferred to sleep under mosquito nets. Apart from the biologist who tried to have a nightwalk every other night, everyone went to bed soon after dinner. Most of the time everyone slept very well and did not rise until well after six.

First chore of the day was to start the fire again and prepare breakfast. Preparing breakfast and feeding 15 people plus breaking up camp was quite time consuming and usually the morning was well advanced by the time we actually started moving again.

Around noon-time we stopped for a light lunch consisting of bread, cheese, sausage and crackers (Fig. 2). The sour-dough bread we carried along lasted the full three weeks without spoiling although the last loaves were reduced to crumbs by the time we got to eat them.

In the late afternoon, one section of the team started putting up camp while another section of the team started preparing the kitchen. Starting a campfire in





Figure 1. Preparing food for three weeks.



Figure 2. Lunch moment, 27 January, 1995

the rain, using thoroughly soaked wood, was quite a challenge but always proved possible. The team leader, who did the food planning, also did the cooking, carefully planning to gradually relieve every individual team member of some weight. All food was carefully rationed and by the time we reached the Southern highway, we still had for 24 hours food left.

### Logbook:

For route, see Maps in Appendix 1.

#### 15 January.

All team members gather at Mountain Equestrian Trails in the Cayo district to get acquainted and to start packing (Fig. 1).

#### 16 January.

The entire team leaves Mountain Equestrian Trails at 11.00h. and travel to British Museum (Natural History) Research Station at Las Quevas. The film crew has a meeting with station manager John Howle. We leave Las Quevas at 14.00h. by 4WD vehicles with assistance of Forest Department personnel. Road leads from Millionario through San Pastor to a location on the upper Chiquibul River. Arrive there at 17.00h.

Erect camp #1, "Chiquibul" Camp, 590m, UTM 16.2948, Q 18.370 at the banks of the Chiquibul river. The forest is relatively rich in species, dominated by lime loving species. Flood plain at this site is relatively narrow with Dumb Cane *Gynerium sagittatum* and Quamwoods *Schizolobium parahybum*.

During the night a Tapir wandered through the camp unheard and unseen, leaving only it's tracks. There were few mosquito's but many sandflies around.

#### 17 January.

We break up camp and receive final instructions from team leader. Walking sticks are provided to every person. Start walking at 09.00h. First we have to cross the Chiquibul river and from there we soon branch off into a small tributary coming down from the south. Wandering, up to the waist immersed in streams quickly becomes a normal part of life (Fig. 3)

The vegetation changes quickly to a more acid loving species composition. Bedrock along the stream shows slate and some conglomerate and granite outcroppings. Treeferns become increasingly abundant. Here we meet our first high waterfall. Since we can not go across it, we go around it which translates into a steep climb towards the ridge. Understory here rather open, dominated by Warrie Cohune *Astrocaryum mexicanum*. Here we also locate a large Cycad





Figure 3. Wandering through streams



Guide Albert Jones with *Ceratozamia* sp. 17 January, 1995.



Figure 5. Close up of cone *Ceratozama* sp. 17 January, 1995



*Ceratozamia* sp. (Fig. 4,5). A little further up, again on the ridges, our first *Colpothrinax cooki* palms.

Establish campsite #2, "Hairy Palm Camp", 720m, UTM 16.2947, Q 18.341 along the same tributary, on a site where a ridge comes down to the level of the stream. Camp named for the conspicuous presence of the "hairy palms" *Colpothrinax cooki*.

### 18 January.

After removing a tick from Mike Bevis' eye, we walk further upstream still going south. The stream is getting narrower. Huge logs are blocking passage and are frequently difficult to cross. We are unable to locate suitable campsite in the narrow valley along the stream. But finally at 15.30h. we locate a suitable site on top of one of the ridges. Forest here is very open with Many *Colpothrinax cooki* and Mountain cabbage Palms *Euterpe macrospadix*. canopy height 15-20 m with occasional giant Oaks *Quercus* sp. emerging above the canopy. It is nice to be away from the constant gurgling sound of the stream. All of a sudden we hear birds and everyone enjoys listening to the Slate Colored Solitaires. Forest floor very soft and covered with a thick layer of dead leaves teeming with cockroaches. "Cockroach Camp", #3, 760m, UTM 16.2946, Q 18.325.

### 19 January.

Start walking again at 09.00h. We leave the stream now and cross over a steep ridge towards the South West. Forest understory open. Frequent clumps of a tall, trailing, hirsute Bamboo are a distinctive feature. After crossing this "divide" we arrive at another upper tributary of the Chiquibul branch which we christen "Ceibo chico". Stream very different here. Rather wide with wide floodplains covered with dense stands of the tall, trailing, hirsute Bamboo. Riverbed is very sandy. Gradually the stream becomes deeper and the valley narrower. Frequently we have to make forays onto the ridges to avoid waterfalls. Finally the valley becomes so narrow that we are unable to find a suitable campsite. Have to return to the spot where we stopped for lunch. Establish camp #4 here. "Turn Back Camp", 780 m, UTM 16.2904, Q 18.304.

### 20 January.

This day starts at 06.00h with a slight drizzle, rain continues all day. Temperature of both air and water at 08.00h: 18°C. A cold front is moving southward. Valley becomes so narrow with frequent waterfalls that we mainly follow the ridges. Angle of slopes measured: 50%. Moving downwards, progress is very slow. Scouts locate more problems ahead so we establish camp #5 at 15.00h., 760 m. UTM 16.2905, Q 18.303. Starting a campfire in the rain is a

challenge which is soon to become routine. At 22.00 h. the rain stops but then hordes of sandflies break loose: "Sandfly Camp".

### 21 January.

It is drizzling again. Scouts spend most of the morning finding a passable route. At 15.00h. we finally continue following the stream downstream. Difficult going. Again we have to travel across steep hillsides around several waterfalls. Finally valley widens and it becomes possible again to descent to the stream. Bedrock in the stream comes off in large, black, square blocks. The forest is very attractive, *Colpothrinax cooki* is absent but there are many large oaks *Quercus* sp. A squirrel rushes off. Establish camp #6, "Squirrel Camp" at 740 m. UTM 16.2900, Q 18.294. At night we see hundreds of small crayfish in the stream. Their eyes glow red when shone upon with a flashlight.

### 22 January.

Temperature at 07.00h is 15°C. Water temperature 17°C. Cloudless skies today. Stream soon becomes 10m wide with a stony bottom. Many small rapids but no longer high waterfalls. High forest along the streams with a high species diversity and emergent giant Oaks *Quercus* sp. First *Liquidambar styraciflua* noted. Treeferns extremely abundant. At 10.40h we reach the confluence of two tributaries of the "Ceibo Chico". Very attractive spot (Fig. 6). High density of *Liquidambar styraciflua*. Along the stream grow many small, white flowering Acanthaceous herbs. Most of these plants are being defoliated by thousands of caterpillars of the large Nymphalid butterfly *Siproeta epaphus*. One adult female of this species flies around, laying more eggs. We now follow the other tributary upstream. Finally we are making some progress again.

At 15.00 h. we stop for making camp #7 on a flat spot along the stream. To our surprise we find some trash ( $\pm$  1-2 years old?) at this spot. Some cans and a large Ketchup bottle. We assume that the trash was left by people prospecting for gold in the area. "Ketchup Camp" 760 m. UTM 16.2865. Q 18.280.

Everything is very moist here. Every piece of soil and every rock seeps water. Vegetation begins to show resemblance to cloud forest vegetation although the trees are not clad as thickly with epiphytes as usually is the case in real cloud forest.

### 23 January.

Air temperature at 07.00h. 16°C. Water temperature 17°C. Leave camp at 09.45h. Continue walking upstream. Superb forest, everything gets wetter and wetter. Everything is covered with moss and lichen. Stream valley narrows down considerably. At one stage we have to pass through a short gorge 2m wide with





Figure 6. Confluence of two tributaries of "Ceibo Chico"

water nearly as deep. Many small waterfalls. Bedrock black, smooth and slippery (not slate). Every now and then outcroppings of conglomerate bedrock with substantial amounts of quartz.

Finally the stream gets so narrow that we decide to leave it and head for the ridge. Very steep climb, slope measured to be 50%. Soil very soft. Finally we arrive at what we assume is the Maya Mountain Divide at a height of 970 m. Forest here completely different. Many high trees and very open understory. Poor species richness. A low species of Bamboo is dominant in the understory.

Make camp #8 at the ridge. "False Divide Camp" 790 m. UTM 16.2848, Q 18.265. At night we hear Howler Monkeys calling from the Chiquibul side. Amazing amount of mosquito's and flies here.

#### **24 January.**

Temperature at 07.00h: 16°C. Slight rain and strong winds during the night, foggy in the morning. Another cold front is approaching. We leave camp at 09.50h. and walk down hill. We reach a small stream very soon. After a little



while it becomes obvious that this stream is not one of the tributaries of the Snake Creek but is the same stream we left yesterday. We find a very old ( $\pm$  1-2 years) machete cut in a vine over the creek. After some wandering around we reach another ridge which proves to be the real Maya Mountain Divide. Forest here similar as on yesterday's crest but now dominated by the tall, trailing, hirsute Bamboo. Again many flies.

Establish camp #9: "Real Divide Camp" at 1000 m. UTM 16.2845, Q 18.263.

### 25 January.

Temperature at 07.00h: 16°C. Strong wind, some rain last night. We decide that we lost valuable time getting here and although Highest Point (1140 m) lies a mere 3.5 km South West of us, it would not be advisable to make a detour of at least one extra day, just in order to reach this point. So, at 10.00h. we start the descent into the upper reaches of the Snake Creek. Find a creek very soon. Lots of slate and some quartz. Deep canyons with many waterfalls. Again we have to circumvent several falls. Tough going.

At 15.00h we reach a site where we establish camp #10. "Eagle Camp" at 780 m. UTM 16.2837, Q 18.244. Again rich forest here with many understory palms and understory ferns. Still many large Oaks *Quercus* sp..

### 26 January

Temperature at 07.30h : 14°C, water temperature 16°C, Soil temperature 17°C. Scouts are leaving to find a way to follow the Snake Creek further down. Gives us some time to do some birding etc. From the edge of a large treefall on a ridge above the camp, there is a good view over the valley. One huge emergent tree is completely covered in *Tillandsia*'s and other epiphytes. Some of the mountain ridges have many emergent *Colpothrinax cooki*, while on other ridges this species seems to be lacking. Just across the valley a large Solitary Eagle is sitting in an emergent tree and allows himself to be watched for 20 minutes until he flies off and disappears into an adjacent valley.

Scouts finally return at 14.00h and it is decided that it is now too late to leave. So we spend night #11 in Eagle Camp as well.

### 27 January.

Temperature at 07.00h: 15°C. A big mass of army ants moved through the camp last night. Some people were forced to temporarily move to another spot. Others were left alone and had an uneventful night.

Leave at 10.00h. Horrendous hike through canyons, over and around waterfalls and very steep hill sides. Once we have to repel ourselves down using ropes. Bedrock consists mostly of very, very, slippery slate.

After 14.30h. terrain levels off a little. Stream widens. Finally we can make some progress again. One of the dominant trees along the stream is Kaway, *Pterocarpus officinalis*. The stream is littered with its conspicuous flattened, round seeds.

Stopped for making camp #12 at 17.00h. Today we covered 3 km on the map in 5 solid hours of walking. Arran Bevis, while collecting firewood, stumbles upon a Maya ruin. "Temple Camp", 560 m. UTM 16.2846, Q 18.218.

### **28 January**

Investigated the ruin. Appears to be an un-looted and un-researched Maya site. Parts of a wall are visible. Stone used for the wall is of local river stone. But lying around are some Limestone blocks that must have been imported from elsewhere. Further up the "hill" another piece of wall is visible. The hill appears to be a relatively large ruin (Fig. 7).

Fig. 7. Sketch of Maya Ruin discovered at Upper Snake Creek, 28 January 1995.



After investigating the ruin we follow the Snake Creek further down. Terrain becomes relatively flat. Very soon we stumble upon Cohune *Orbignya cohune* and other Lime-loving tree-species. We reach a wide and flat valley and straight away we find an abandoned camp. The camp appears to be associated with a large Maya ruin complex just a little away from the stream. The ruin does not show signs of looting but apparently archeologists, staying at the camp we found, did some primary investigations. The camp is very clean. No trash around nor have any trees been damaged unnecessarily. At this site some very good butterfly collecting.

We followed the Snake Creek further down through the wide valley. Very wide floodbank with secondary vegetation typical for such streams. Many *Heliconia*'s, Quamwoods *Schizolobium parahybum*, Maranthaceae and many interesting *Passiflora*'s. The stream suddenly disappears into a sinkhole under a tall cliff. We tried to find our way out following a dry stream bed, but this ended in a spectacular cañon with deep sinkhole. We were unable to find our way around this so we returned to the first sinkhole where at least there was water. Here we established camp #13; "Sinkhole Camp" at 530 m. UTM 16.2852, Q 18.206.

### 29 January.

Temperature at 07.00h 15°C. Water temperature 18°C. Scouts go out to find an "exit". Again there is time for some collecting. The weather is good and so is the collecting. A second scouting team stumbles on a very large Maya temple complex. This site has also been visited by archeologists. The top of the central, very large structure has been underbrushed to reveal the structures. Again no trash and the underbrushing was a clean job with no remaining trees scarred or anything. From one cleared spot on top of a ruin there is a beautiful view over the Snake Creek Valley with steep limestone cliffs in the background (Fig. 8).

Scouts return in the early afternoon with news about another ruin complex. They have also found a trail that was used by the archeologists. We leave Sinkhole Camp around 14.30h. for a forced march over the hills. At 16.30h. we reach a site suitable for camp #14 even though there is no water. Fortunately we brought all the water we could carry. Forest of medium stature but with spectacular understory of low bifid palms (*Geonoma* sp.?). Encountered some Chicle trees *Manilkara* sp. that show signs of tapping many, many years ago. "No Water Camp", ± 480 m. UTM ± 16.2870, Q 18.213

### 30 January.

Temperature at 07.00h: 17°C. Started walking at 09.00h. After strenuous walk uphill and downhill we meet the Snake Creek again which is now a narrow muddy stream with a sandy underground. Bedrock limestone, sometimes forming interesting ledges. After following the stream for barely more than half



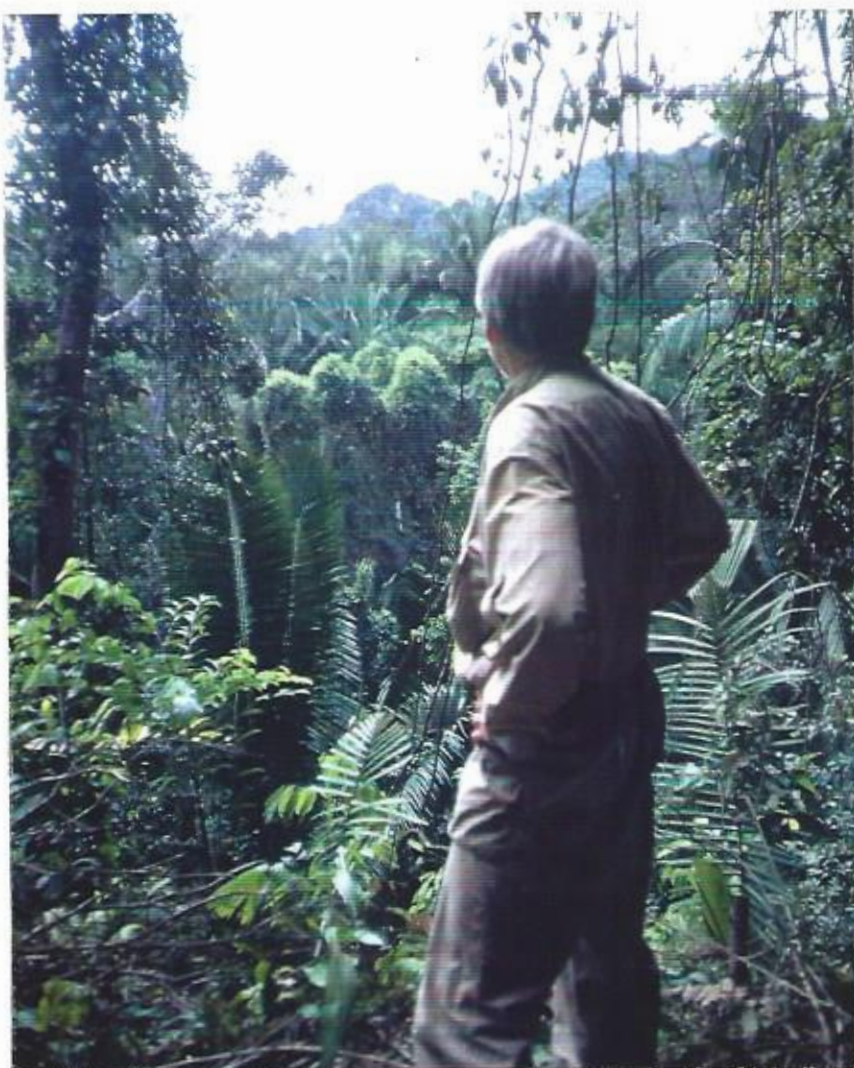


Figure 8. View from top of one of the Maya Ruins in Snake Creek Valley. Limestone outcropping in the background.

an hour, the stream disappears in another sinkhole. A scouting team goes ahead to find an exit. The remainder of the team makes camp #15. Vegetation low, many secondary growth species. The site is at the edge of an overgrown sinkhole. The size of this 'treegap' is enormous, at least 5 hectares. There are no signs of human activity or fire. A natural treegap that just kept widening?, storm damage? Unfortunately the site is riddled with ticks. Mostly the minute "Warrie" or "Seed" ticks. Everyone gets covered by literally hundreds of them. We use alcohol and duct tape to remove them.

"Tick Camp", 410m, UTM 16.2887, Q 18.208. Few people get a good night rest. All night long, flashlights are lit and the rasping sound of uncoiling duct tape is heard.

### 31 January.

Leave camp at 09.30h. Most people feel miserable and are anxious to leave this place. We climb mostly uphill to an altitude of 480 m. Several untapped Chicle trees *Manilkara* sp.. At 11.30h. we reach the streambed of the Bladen. Although there is no water in the stream, everyone is elated. Finally the streambed narrows down and becomes a muddy trail. To everyone's horror, the stream bed disappears into a massive cave. Morale is severely depressed at this stage. After lunch we start climbing over yet another hill.

Forest is very impressive and the walk, however hard, is very beautiful. Forest high, widely spaced trees with understory existing nearly exclusively of low bifid palms (*Geonoma* sp.?). The whole has a distinctive park like atmosphere. We see some very large Mahogany trees *Swietenia macrophylla*. One tree has a bole of  $\pm 2$  m above the buttresses. The actual diameter at breast height (DBH) can not be accurately measured because of the huge buttresses but is estimated to be between 5 and 6 m.

Around 16.20h. we find a bath tub sized puddle in the forest and we decide this is a good site for camp #16. "Waterhole Camp" at 350m. UTM 16.2926, Q 18.222. The forest is relatively low and dense again. Searching for leftover ticks becomes a social activity.

### 1 February.

Temperature at 07.00h: 17°C. Leave camp at 10.10h. Very soon we hit the streambed of the Bladen again. But still no water. We follow the streambed and reach yet another sinkhole at 11.15h. Fortunately the sinkhole is little more than a small cave and we all pass through it without difficulty, and pick up the streambed on the other side. But at 12.30h. we reach a sinkhole in a big cave. At the bottom of the cave is a big lake which we dare not cross. Altitude at the entrance of the cave 295m. We circumvent this sinkhole by climbing the hill on the south side. a steep, 100 m climb. On top of this hill we stumble upon a very fresh trail. Cutmarks are only 1 or 2 days old! We also find some very old X-shaped (logging?) marks on trees. After the descent, following this trail we come into the Bladen again. This time there is abundant water! Some deep pools to refresh our dirty bodies. The water is also really soothing for our many itching tick bites, chigger bites and athletes foot infections. We see medium sized crayfish, large fresh water crabs, a lot of catfish and many other small fishes. We feast on wild Passionfruits *Passiflora adenopoda*.

Camp #17. "Catfish Camp", 250m, UTM 16.2958, Q 18.242. Here we also find a large camp that has been abandoned just one or two days before. This camp is probably connected with the trail we found earlier. This camp is situated where Bladen surfaces again (other side of yesterday's cave?). Forest high of stature.



Many Cohune *Orbignya cohune*, Quamwood *Schizolobium parahybum* and Hogplum *Spondias mombin*. Understory open with plentiful Warrie Cohune *Astrocaryum mexicanum*.

Just before nightfall it starts raining again. first it's just a drizzle but later in the night there is some heavier rain. Since, for a change, we didn't pay enough attention to making a proper camp, some team members get themselves and their sleeping bags soaked through.

### 2 February.

At 07.00h. air temperature 19°C. Water temperature 21°C. It is raining again. We leave Catfish Camp at 10.30h. After a few minutes walk the river has disappeared again. The rivers on this side of the divide have been disappointing us so far and also it becomes apparent that it is time that we return to civilization as soon as possible. Very soon we pick up a trail that leads south, away from the Bladen. It appears to be an old logging trail clearly made by a bulldozer. The trail is still flat and level at many places but trees have grown up on it and on one place the trail is blocked by a rock the size of a small house. Sometimes the trail has disappeared all together and it takes some effort to find it back. The more we progress the more trails (hunting trails judging the frequent spent shotgun shells) we encounter and sometimes it is difficult to decide which one to follow. Also several streams have formed on the trail, the result of past heavy traffic compacting the soil. Forest is very different here, low of stature, very dense with many lime loving species. At many places limestone outcroppings surface. Strangely enough the soil appear badly drained and there are many seepage streams (often filled with Tapir droppings). We climb to some sort of plateau at an altitude of 460 m. From there on its gradually down again. Surprisingly we pass through a small valley with clearly acid soils judging by the vegetation of Treeferns, Melastomaceae and Polewood *Xylopia frutescens*. Just as abruptly the we return on limestone soils again with large Kapok *Ceiba pentandra*, Botan *Sabal morissiana* and Chicle *Manilkara* sp. High forest now, the swampy character has gone. No streams or puddles here. Here we erect camp #18 "Trockopass Camp", 410 m, UTM 16.3011, Q 18.197. It is still raining.

### 3 February.

Heavy rain during last night. We collected enough water from the tarps for cooking and drinking. It still rains at 09.30h when we start our last 10 km hike to the Southern Highway. At this stage we are not sure where this trail will take us. Initially we believe we are heading for Deep River and informed the pick up team accordingly, but after some GPS readings along the route it becomes clear that Golden Stream is a more likely exit.

Everyone is tired and dirty. Some members of the team really suffer from fungus infections. But the prospect of reaching "civilization" again seems to give many

people wings. The more we progress, the more signs of human impact we encounter. The trail is marked with hunting camp after hunting camp and dozens of spent shotgun shells, plastic bags and empty tins litter the trail. The trail gradually leads us down but going is still difficult. The trail is well compacted by years of use and very slippery after the rain of last few days. Then all of a sudden there is one last steep hill to cross which is quite an ordeal. It is slippery and we already covered quite a few kilometers. After this hill we reach the flatland of Golden Stream. Here we find our first Corn milpas. It is extremely difficult going here. There is no longer high forest but just thick, impenetrable secondary growth. So we are forced to follow the agricultural road. This road is no more than some deep ruts in heavy clay. At every step you sink away in the mud, so going is very difficult. Our heavy backpacks are not a big help in this aspect.

Finally, exactly at 18.00h. we hit the Southern Highway at Golden Stream. It takes some time to convince some members of the team that the muddy track we reached is actually the Southern Highway. Exactly at this point and time one member of our pick up team; Tineke Boomsma, passes and administers first aid by providing fresh muffins and other pastries. Later that night Marguerite Bevis, the other half of the pick up team, arrives with even more provisions. We put up camp #19 with the family of Ignacio an Honeria Shoo.

"Golden Stream". 20m, UTM 16.3078, Q 18.098. This is the first night no one goes to bed before 23.00h. Forest dominated here by human impact. Mostly secondary growth with isolated pockets of tall trees.

#### **4 February.**

Leave Golden Stream, team members scatter and return home.



### General observations:

The forest we traveled through was generally untouched by human hands. Between the starting point at the Chiquibul river and the Snake Creek Valley, the only signs of past human activities we encountered were one pile of trash and a single machetecut through a vine. We assumed that both signs were related to each other and that these signs were probably left by an expedition prospecting for gold in the area. The forest on this stretch appeared untouched by human hands. Only when we reached the Snake Creek we started finding signs of recent human presence. The people that visited this area were probably archeologists since all trails and camps we found were associated with Maya ruin complexes. No obvious signs of looting were found. Once we reached the Bladen, signs of human activities became more and more common. And especially the stretch from the Upper Bladen to Golden Stream (which lies partly within the Bladen Nature Reserve and partly within the Maya Mountain Forest Reserve) appeared frequently traveled and signs of hunting became increasingly common. On a limestone ledge in a small stream (probably still within the Bladen Nature Reserve, someone had scratched "Salva Creek" ("Salva" signifying "Salvadorian").

Although the forest we traveled through should technically be called "Primary Forest", we encountered a lot of secondary vegetation. Sometimes these patches of secondary vegetation were small as would be expected in a natural treefall gap, but often they were up to several hectares large. These large areas of young secondary vegetation probably have come into existence where natural gaps have continued to enlarge as bordering trees fall, sometimes over a period of several years (Denslow & Hartshorn, 1994).

Smaller treefall gaps were noted very frequently along the steep slopes of the stream valleys. The high incidence of such gaps, frequently baring the bedrock indicate highly unstable soils but also, the apparent high rainfall figures and constant high humidity promote rapid soil formation and re-colonization of such gaps.

Signs of Hurricane damage and/or lightning damage were often encountered as many large trees had parts of their crown missing, most noticeably so, many of the *Podocarpus guatemalensis* trees. Sometimes patches of *Pteridium* Ferns were noted, presumably the result of fires caused by lightning. Typical other first colonizers of smaller treegaps were *Cecropia obtusifolia* and Treeferns. Meadows (1988) suspects that where adult *Colpothrinax cookii* palms are dominating, this is an indication of past storm/hurricane damage. Meadows (1988) also reported Pine *Pinus oocarpa* as a colonizer of gaps caused by fire but this expedition encountered no Pines along the route.

The general observations indicate a high turnover rate and resulting high dynamics of the forests we traveled through



Figure 9. Flowering *Tillandsia* sp.



## Species of interest.

### Flora:

#### Bromeliaceae:

Many species of epiphytic Bromeliaceae were noted, mostly species of the genus *Tillandsia* (Fig. 9) Unfortunately Bromeliaceae are very bulky to collect and therefore, we restricted ourselves to making pictures of some of the more spectacular species. Harry Luther from Selby Botanical Gardens, Sarasota, Florida, informed us that he didn't expect many new bromeliad species for the Belize list since Belize is lacking in altitude. During this expedition we noted, however, the completely different habitats at the higher elevations in the Maya Mountain Divide compared with the better researched lowland regions. If there are any new and interesting Bromeliaceae to be found in Belize, it will certainly be in these areas. Bromeliaceae are therefore certainly interesting topics for further research.

#### Cucurbitaceae:

Special attention was paid to two Genera of Cucurbitaceae. The genera *Gurania* and *Anguria* are important nectar and pollen sources for Heliconiinae butterflies. Locating and then observing *Gurania* and/or *Anguria* plants is one of the best ways to find unusual *Heliconius* butterflies. Interesting was the find of the three lobed *A. (pachyphylla?)*. This same species was recently reported for the first time from Belize (Meerman & Boomsma, 1995b).

#### Cycadaceae:

Surprisingly we did not encounter any *Zamia loddigesii*, the only Cycadaceae that is common in many areas of Belize. Instead we encountered one large, solitary specimen of a related genus: *Ceratozamia* (Figs. 4,5; Appendix 2, table 1.). The exact species identity is uncertain at this stage.

#### Cyclanthaceae:

Cyclanthaceae are monoecious, often palmlike herbs either terrestrial, rooted in the ground and climbing or wholly epiphytic. Standley and Record (1936) report only one Cyclanthaceae from Belize: *Cardulovica utilis*. *Cardulovica* are terrestrial herbs with the leaves palmately divided into 4 segments while Standley and Record describe an epiphytic vine with palm like, 2 lobed leaves. Their description probably refers to an *Asplundia* sp. Spellman et al. (1975) list one *Asplundia* sp. but also maintain *C. utilis*.

One of the Cyclanthaceae found was probably *Asplundia labela*, a species that has recently been reported from the Columbia River Forest Reserve (Holst, 1993). Assumedly the same species has also been reported from the Upper Mullins River basin (Meerman & Boomsma, 1994a) as a "hemi-epiphytic fish-tail palm". Also the "palm-like philodendron" (Anon., 1989) reported from Highest

Point is probably referable to this species. This species was generally very common along the route, especially so at the higher elevations (Appendix 2, table 1.) where the species tended to be a dominant component of the understory.

The other Cyclanthaceae noted was identified as *Cyclanthus bipartitus* (Fig. 10). This terrestrial species with 2m large, shiny leaves was encountered as solitary individuals on the east side of the divide (Appendix 2, table 1.). The monotypic genus *Cyclanthus* is unique in displaying a thickened midrib on each segment of the bifid leaf (Hammel, 1986; Gentry, 1993). This observation constitutes a new species record for Belize.



Figure 10. *Cyclanthus bipartitus*, 27 January 1995.



### **Fagaceae:**

Very noticeable were the many extremely large Oaks (*Quercus spp.*) that we encountered at the higher altitudes (Appendix 2, table 1.), even on top of the ridges. Many trees had tall, straight boles. They also often had large buttresses. No flowering or fruiting trees were noted but at some places fragments of cups were found that were at least 5cm across.

### **Guttiferae:**

The valuable timber producing Santa Maria *Calophyllum brasiliense* was noted to be common all along the expedition. Apparently this species is indifferent to soil type. Some trees had a DBH of close to 1m which is quite large for this species. Large trees of this species were even noted on top of the highest ridges (Appendix 2, table 1.).

### **Hamamelidaceae:**

*Liquidambar styraciflua* has a distribution extending from the southern United States down through the highlands of Central America. This species was recorded from the Cockscomb area by Standley and Record (1936) but this record was subsequently forgotten and Hartshorn (1984) does not list this species. *L. styraciflua* was "rediscovered" for Belize in 1992 (Anon. 1992). We found this species to be common at intermediate altitudes on the Chiquibul side of the Maya Mountain Divide (Appendix 2, table 1.; Appendix 3.).

### **Magnoliaceae:**

One *Magnolia sp.* was collected and several more individuals were seen at the higher elevations. The first record of a *Magnolia* in Belize was by Holst (1993), based on specimens from Little Quartz Ridge in the Colombia River Forest Reserve. This species was tentatively identified as *M. cf. yoroconte*. The specimen we collected probably belongs to the same species. Our specimen was sterile but forming flower buds (Appendix 3).

### Orchidaceae:

Many species of orchids were noted along the route. Only specimens that were flowering (and within reach) were collected (Fig. 11 ; Appendix 3.). One collected specimen (*Lockhartia nr. integra*) (Appendix 3.) is not listed in Catling & Catling (1988) and may constitute a new species record for Belize. This and other specimens still await correct identification by experts at the Marie Selby Botanical Gardens in Sarasota, Florida.

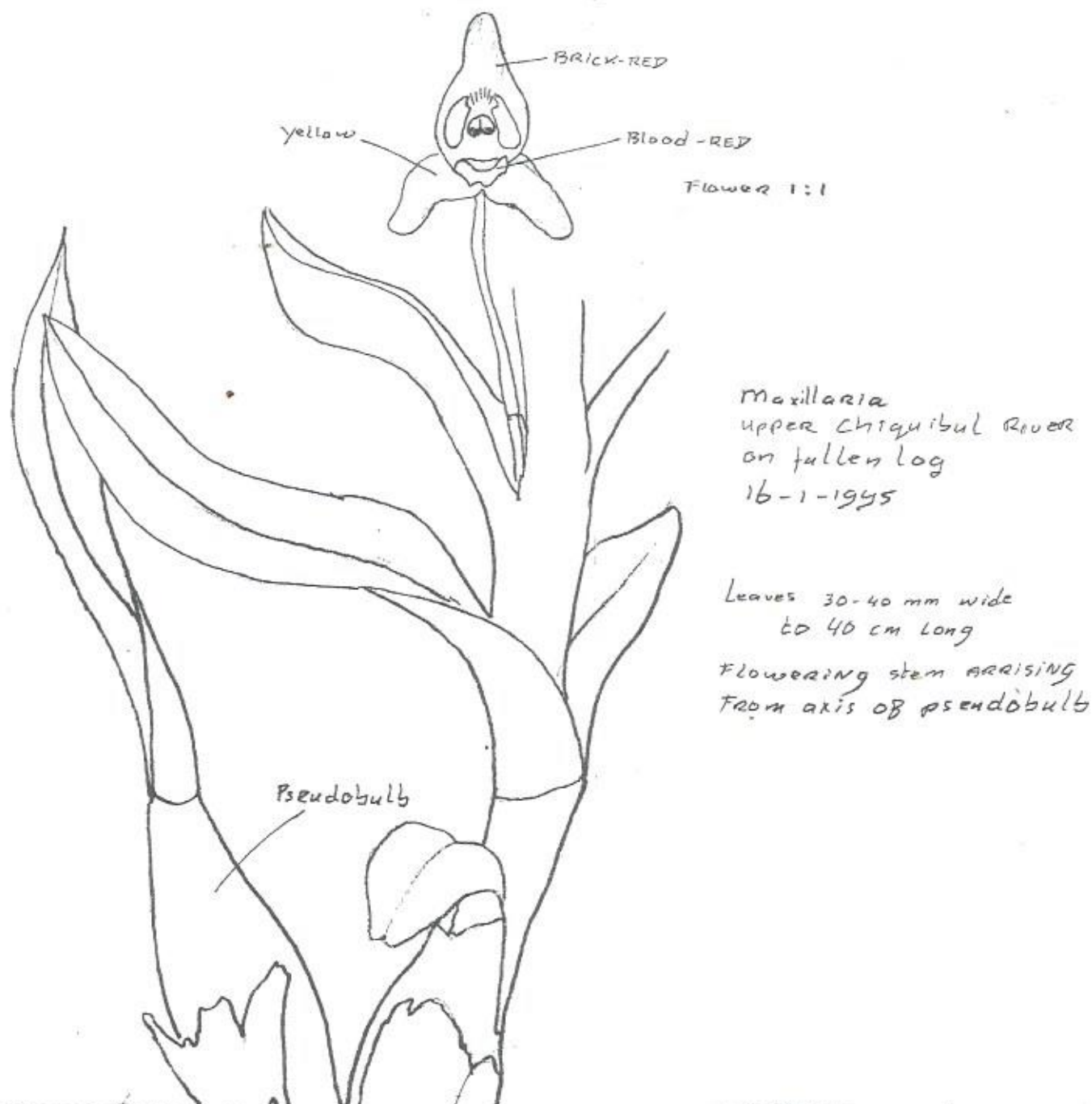


Figure 11. *Maxillaria* (eliator ?). Drawing, 17 January, 1995.



### Palmae:

One of the most astonishing features along this expedition, was the enormous variety of palms. No doubt many palm species in Belize still await discovery and the authors regret not being more knowledgeable on this subject. In total we were able to identify only 8 species up to species level. Especially common were understory species of the "Geonomoid alliance" including many *Chamaeodora* spp. One "fish-tail" leaved species with a single, erect flower spike (*Calyptrogyne donnell-smithii?*) was especially abundant and sometimes dominating the understory vegetation cover.

A noteworthy palm along the expedition was *Colpothrinax cookii*. This palm was discovered for Belize in 1987 (Meadows, 1988). Originally this species was described as late as 1969 from the department Alta Verapaz in Guatemala (Read, 1969). Unfortunately the population at the type locality has meanwhile been wiped out by agricultural expansion. Recently it has been found that the distribution of this palm extended into Belize (Meadows, 1988). Here it occurs on the higher ridges of the Maya Mountains and the Belizean population appears quite safe for the time being. This palm is quite common and definitely a dominating feature along much of the Maya Mountain Divide. The older palms are emergent trees which can be seen from a great distance (Fig. 12). They can even be seen when driving along the Hummingbird Highway and scanning the high ridges south of the road.

The genus *Colpothrinax* has only three known species. One species occurs in Panama, the second is a lowland species in Cuba and the third is the Belizean *C. cookii*. We found this palm to be common anywhere between 700 and 1000 meters altitude. Its presence is most pronounced at the crests of narrow ridges. At the highest ridges we found mostly tall adult trees with few young trees. Young trees, on the other hand were more common at lower elevations and below the actual crests of the ridges. Meadows (1988) suggests that young *Colpothrinax* palms "sit" in the understory until a gap is created, then they start growing and finally become emergent trees. Since the higher, exposed ridges are probably prone to storm damage (creating gaps), this might explain why this palm was a dominant emergent on many of the ridges but not in the lower regions.

Superficially *C. cookii* resembles Botan *Sabal morrisiana*. The leaves are also fan-shaped and the entire tree can be just as tall. Most striking difference with Botan is the thick layer of fibrous material covering the trunks of young trees and often (partly) remaining on older trees. For this reason this species was quickly christened "Hairy Palm". Trees that had lost their fibrous cover, displayed a stem with longitudinal grooves. During the expedition, many *C. cookii* trees were flowering. The bright yellow inflorescences were very conspicuous. The thick rachis of the inflorescence is brown-hirsute (Appendix 3.). We did not encounter

any fruits but they are reported to be grape sized and ripe in August (Anon, 1989).



Figure 12. *Colpothrinax cookii*. False Divide Camp, 23 January, 1995



### Passifloraceae:

A total of 10 different Passionflowers species were encountered along the expedition. Passionflowers are one the special interests of the senior author and many species can be positively identified even in sterile condition. Two of the species noted (*Passiflora costaricensis* and *P. helleri*) constitute new species records for Belize (Appendix 3). *P. costaricensis* was encountered only in the Snake Creek valley, but occurred there in large numbers. *P. helleri* proved to be more widespread and was encountered on both sides of the Maya Mountain Divide. Noteworthy was the virtual absence of Passionflowers on the acid soils. Passifloraceae are the foodplants for many Heliconiinae butterflies and these butterflies were not surprisingly scarce as well in these regions. Based on the presence of *Heliconius sapho*, its only foodplant; an 11th species of Passionflower: *P. pittieri*, had to be present as well in the area. *P. pittieri* is another species that was only recently confirmed for Belize (Meerman, 1993).

### Other groups:

We collected herbarium material of a woody plant displaying brilliant red cauliflorous flowers. Bunches of these flowers were sometimes visible isolated, high in trees. The tubular flowers were highly attractive to hummingbirds. We could not discover for sure, but we had the impression that these isolated patches of flowers did not belong to the tree they were seen in. Neither could we discover a distinct vine. Tentative conclusion was that the plant was a parasite. The most important group of epiphytic parasites in Central America are the Loranthaceae (Mistletoes). Loranthaceae always have opposite leaves and are therefore not compatible with the specimen collected.

### Arthropods:

Most attention was paid to the arthropods groups Odonata and Lepidoptera. Nevertheless, some other observations were made.

Large fresh water crabs were common in most of the streams and empty shells and shell fragments, resulting from predation by Water Opossums and/or River Otters were commonly encountered. Other Crustaceans observed include small, 5cm long, freshwater crayfish that were seen, usually at night, in large numbers in the streams at the lower altitudes. A larger species of crayfish of  $\pm 12$  cm was observed in the Upper Bladen.

A medium sized, grayish "Tarantula" or Bird Spider (Fig. 13) was collected along a stream near Cockroach camp. This species has as yet not been identified.

Walking towards Golden Stream, we noticed some Leafcutter ant *Atta* sp. nests. Only then we realized that we couldn't remember have seen any of these since we left the Chiquibul river. We were unable to come up with a explanation for the

apparent absence of Leafcutter Ants along the Maya Mountain Divide. Stevens (1983) reports Leafcutters ants as occurring up to 2000 m in Costa Rica, since, the Maya Mountains do not even reach this altitude, "high" altitude alone does not appear to provide an explanation.



Fig. 13. Unidentified Bird Spider, 18 January 1995.

#### Odonata:

The Odonata collected on the expedition (Appendix 2, table 2.) reflect a species composition typical of fast flowing streams (Boomsma & Dunkle, in press). *Archilestis grandis* is a rarely collected species, and only a few specimens have ever been recorded before from Belize. *Argia harknessi* may be a new country record but since the collected specimen is a female, exact identification is difficult.



## **Lepidoptera:**

The diurnal Lepidoptera fauna of Belize is getting relatively well known (Boomsma & Meerman, 1993; Meerman, 1992; Meerman & Boomsma, 1993, 1994a, 1994b) but data from the higher altitudes of the Maya Mountain Range have so far been virtually lacking. This expedition provided, therefore, a good opportunity to fill this gap in knowledge somewhat. It was not possible to carry a UV light and power source along on the expedition, so no nocturnal Lepidoptera were collected.

Unfortunately, the conditions for collecting diurnal butterflies were not ideal on the expedition. Most of the time, we traveled under closed canopy with low light intensities. Secondly, the valleys we traveled through were narrow and so only a few hours of sunlight daily, reached the valley floor. Thirdly there were several days with adverse weather conditions and last but not least, it was very difficult to catch any butterflies while all attention and energy was needed for traveling. Effectively, all this meant that most collecting was limited to the few moments around lunchtime. Still an interesting set of butterflies was noted (Appendix 2, table 3.). In general the set of butterflies noted is typical for closed, mature forest also the fact that most species were seen in low numbers with very few species really common is also typical for closed, mature forest habitats (Boomsma & Meerman, 1993; Meerman, 1992).

### **Papilionidae:**

The early dry season is usually a bad time to collect Papilionidae with most species peaking towards the beginning of the rainy season. The results of this expedition confirm this experience. One species *Parides childrenae* was recorded from Belize only once before (Davis, 1928) and is definitely a rarity. Tyler et al. (1994) list this species as rare and occurring only "in large primeval wet forest, hilly country", exactly the type of habitat we encountered it in.

### **Pieridea:**

One *Itaballia* species was collected that may need specialist attention. This female specimen is identical to *I. pisonis*, a species from Western South America (D'Abrera, 1981). The only related species reported from our region is *I. pandosia* but the markings are unlike this species. Possibly the specimen belongs to an as yet un-described (sub)species. More specimens are required to establish this.

### **Nymphalinae:**

Along the Chiquibul side of the Maya Mountain Divide we encountered enormous amounts of caterpillars from the Nymphalid butterfly *Siproeta epaphus*. This species is not a rarity in many parts of Southern Belize but to encounter the larvae in such numbers must be considered unusual. The foodplant was a small, white flowering herb, growing along the streams and

clearly belonging to the Acanthaceae. No more exact identification could be made.

#### **Heliconiinae:**

Two new Heliconiinae species for Belize were recorded during the expedition. The first one: *Eueides procula* is a smaller species of which the caterpillars live on a small herb: *Erblichiana* (Turneraceae) which is an unusual foodplant for Heliconiinae. The species is widespread from Guatemala to Brazil but generally rare (DeVries, 1987). The second new species record is *Heliconius hecalesia*. One of the recorded foodplants for this species is *Passiflora biflora*, possibly this species also breeds on the similar *P. helleri* which was found nearby. This little known species has a distribution from Mexico to Venezuela and is generally associated with premontane wet forest habitats (DeVries, 1987). Other interesting Heliconiinae are *H. cydno* and *H. sapho*. These two species are Müllerian mimics sharing the same pattern. Consequently, both species are very difficult to distinguish while on the wing. Both species are typical for wet forest habitats.

#### **Ithomiinae:**

The relatively large number of Ithomiinae collected is indicative for forested habitats. One species: *Callithomia hezia* constitutes a new species record for Belize. This species is usually associated with lowland rain-forests (DeVries, 1987).

#### **Morphinae:**

The Blue Morpho *Morpho peleides* was common wherever we went. A second species of Morpho, the White Morpho *Morpho polyphemus* has been recorded from the area around Highest Point (Anon., 1989) but since this species appears to have only one generation each year from July - September, this species was not seen during the expedition. The interesting *Anthrhea militiades* constitutes a new record for the Cayo district. The only other Belizean record is one old record from the Toledo district. The specimen was caught while it was flying close to the ground during light rain.

#### **Riodinidae:**

The bright blue *Mesosemia gaudeolum* was probably one of the most common butterflies encountered during the expedition. This species appears to be strictly confined to narrow, shaded, stream valleys.

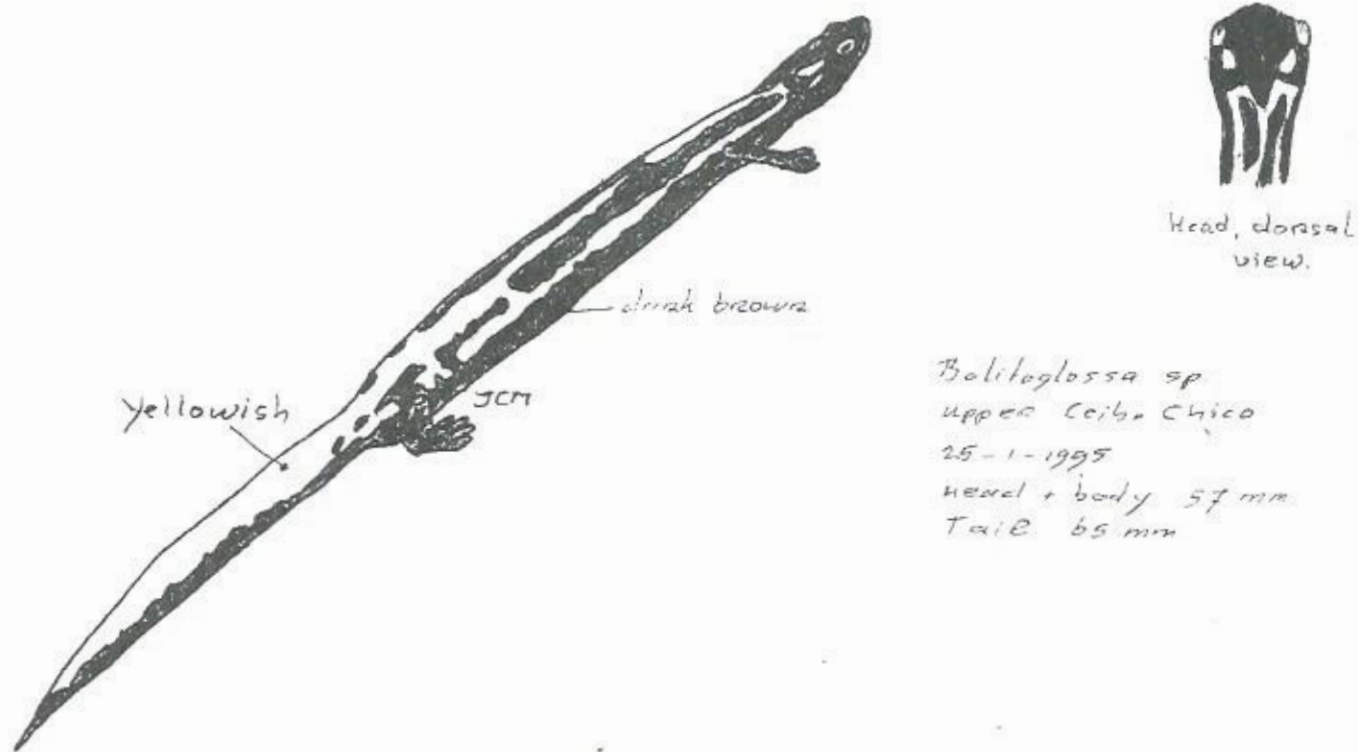
#### **Other families:**

A small blue diurnal moth was very common along the streams on both sides of the Maya Mountain divide. Frequently this moth was seen sitting just above the water level. One occasion a female moth was seen laying eggs on a stone directly above water level.



### Amphibians:

In spite of the fact that the rainy season was drawing to an end during the expedition, a surprising amount of amphibians was noted. Both salamander species (unfortunately represented by single specimens) were identified only up to genus level (Table 4.). The brown species is probably either *Bolitoglossa mexicana* or *B. rufescens*. Both species have been previously recorded from Belize. The other specimen, a slender species with yellow longitudinal stripes (Fig 14) is more difficult to place. The species can not be keyed out with any of the keys available to us. There is a definite possibility that this specimen represents a species new to science. Expert opinion is needed in both cases.



*Bolitoglossa* sp.  
upper Ceiba Chico  
25-1-1995  
head + body 57 mm  
Tail 65 mm

Figure 14. *Bolitoglossa* sp. with yellow stripes, 24 January 1995.



Figure 15. *Bufo campbelli* in amplexus, 1 February, 1995.

The commonest anuran encountered on the expedition was *Bufo campbelli*. This recently described species (Mendelson, 1994) was originally only recorded from the Columbia River Forest Reserve. Recently specimens were also found in the Bladen Nature Reserve. This species is very similar to the very common *B. valiceps*, and has been confused with this species in the past. This species proved to occurring commonly on both sides of the Maya Mountain Divide. Generally adults were seen along the streams but occasionally individuals were encountered even on the highest ridges (Appendix 2, table 4.). The species was still reproductively active. The call, which is similar to but softer than the rattle of *B. valiceps*, was heard at most camps. During nightwalks, toads were commonly encountered in amplexus (Fig. 15). Egg strands, toadfish and newly metamorphosed toadlets were encountered all along.

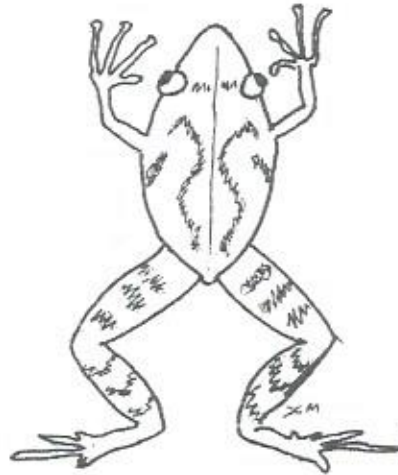


Other species that were still reproductively active include the Glassfrog *Hyalinobatrachium fleischmanni*. Not only isolated males were calling along the streams but we also collected a female with ripe eggs clearly visible through the transparent skin of the belly. Also we found a few clumps of eggs typical to those of the genus *Achalychnis*. Unfortunately we could not discover any adults so the exact species identity remains unknown.

Three rainfrog  
(*Eleutherodactylus* spp.)  
species were collected  
(Fig. 16; Appendix 2, table  
4). The taxonomy and  
distribution of this family is  
are still poorly understood  
and these collections have  
to be considered very  
valuable.

*Rana juliani* is a "typical"  
frog. This species is  
endemic in the Maya  
Mountains (including the  
Mountain Pine Ridge) in  
Belize and is apparently  
restricted to small, fast flowing streams. We found it to be relatively common at  
many of the higher locations (Appendix 2, table 4.). It's lowland counterpart, the  
Rainforest Frog *Rana vaillanti* was encountered in the Bladen river at lower  
altitudes (Appendix 2, table 4.).

Figure 16. *Eleutherodactylus chac*. 25 Jan. 1995



### Reptiles:

Surprisingly few reptiles were encountered during the expedition (Appendix 2, table 5). Especially surprising was the small number of snakes that were seen. Only two poisonous snakes were encountered, both Coral snakes *Micrurus nigrocinctus*.

## Birds:

The fact that we usually traveled along streams was not beneficial for observing birds. The constant noise of the stream filtered out nearly all other sounds and many interesting bird species we probably never noticed simply because we couldn't hear them. Some bird sounds, however were loud and unmistakable. The song of the Northern Nightingale Wren for example accompanied us all along the expedition. Even those members that were usually completely ignorant about birds could, after three weeks identify a Nightingale Wren by its song. Another very distinctive and very attractive, song was that of the Slate-colored Solitaire. But his metallic song was usually only heard when we moved away from the streams.

On three locations an unusual Nighthawk was heard (Appendix 2, table 6.). A very common species in Belize is the Pauraque which bears the local name "Who You" in Creole or "Xpuhuy" in Yucatec Maya. Both names mimicking the birds call. If the Pauraque calls "Who You", the call of the Nighthawk heard during the expedition can be described as a distinctively different "Whàt You". The call was taped and later compared with the tape of Hardy et al. (1989). The only species more or less matching the call taped was the Tawny-collared Nightjar *Caprimulgus salvini*. This species has been recorded for Belize as Accidental (less than 3 records)(Garcia et al. 1994). These records may indicate that this species is actually a resident in the southern forests of Belize. The normal known distribution of this species restricts itself to the lowlands of Southeastern Mexico. In the past this species has been confused with the Yucatán Nightjar *Caprimulgus badius* from which it differs only by call. The latter species is locally common in Belize (Meerman & Boomsma, 1993.).

One of the most striking observations made on the expedition was decrease in amazonia parrots as the altitude increased. The only parrots present in any number at higher altitudes were the Brown-headed Parrot and the White-crowned Parrot. No Scarlet Macaws were noted on either side of the Divide.

On one location, which was then christened "Eagle Camp" a single Solitary Eagle *Harpohaliaetus solitarius* was observed. This species is reported as rare in Belize and also listed as a Threatened species (Garcia et al. 1994). This species has also been observed by expeditions to Highest Point (Anon., 1989; Meadows, 1988) and the entire region seems to be an important habitat for this rare species.

Probably the most frequently noticed hummingbirds along the expedition were both the Stripe-tailed Hummingbird and the Violet Sabrewing. Both species have a limited distribution in Belize but apparently reach high densities in the habitats we traversed.



Other species of interest include: the Green Honeycreeper, the Chestnut-headed Oropendula, the Singing Quail, and the Common Woodnymph. One last bird of special interest is the:

### **Keel-billed Motmot, *Electron carinatum***

This species has always been considered to be the rarest of its family (Mountfort, 1988) and appears rare throughout its range from S. Mexico to Costa Rica (Collar *et al.* 1988). Apparently there have been no records in Mexico since 1952 and it is feared extinct there due to loss of habitat (Collar *et al.* 1988). Also there are only a few anecdotal records from Guatemala. Only Honduras appears to have some documented populations (Miller pers. com.). An obligate forest dweller, it appears likely that Belize has the largest known population of the Keel-billed Motmot. Most of these populations are small, fall within existing protected areas but are isolated from each other. (Miller & Miller, 1995).

Miller & Miller studied the Keel-billed Motmot for several years at the archeological site of Caracol. The relatively large population known from this site (map 2) is a reflection of this study. The Millers estimated a population density for Caracol of one pair per 520 ha. The senior author assisted the Millers for several years during their studies and is therefore well familiar with the Keel-billed Motmot. Later, the senior author also assisted the Millers on a survey in the Upper Mullins River basin (Stann Creek district) and here a much higher density of one pair per 105 ha was found. Also Parker (1993) lists the Keel-billed Motmot as "fairly common" in parts of the Columbia River Forest Reserve. The Nature Conservancy G-ranks the Keel-billed Motmot with a 2 on a scale of 5 where 1 denotes very rare and 5 indicates that the species is common (Iremonger and Sayre, 1994).

During the expedition, Keel-billed Motmots were heard vocalizing at 8 different locations. At these 8 sites, a total of 14 different birds were heard calling which would indicate a total of 28 adult birds assuming that all vocalizing birds also had a partner. Most calls were only heard from very close distances for a very short period usually before dawn. And no matter how distinct the call is, it was very easy to miss it. Also we frequently followed streams or camped near streams and the noise of the stream must have drowned out many calls. Table 6 indicates that typically the birds were heard at campsites away from the water and never during the walk from one camp to the other. Taking into account the restrictions presented by the type of survey conducted, is safe and probably even very conservative, to assume that the number of birds (pairs) along the route was at least double that of the number of birds heard. Assuming the maximum distance from which birds can be heard in dense forest to be 250 m in all directions, a total of 2500 ha was surveyed for Keel-billed Motmots during the expedition resulting in a density of one pair per 90 ha. A much higher density than in Caracol and even the Upper Mullins River basin.

It is interesting that the more attention is paid to the Keel-billed Motmot, the more populations get known. The senior author doubts very much that the different populations of this species are as isolated as Miller & Miller (1955) indicate. Based on information currently available, it appears that the Maya Mountain range provide suitable habitat for this species but that this habitat is relatively inaccessible to human observers. The Caracol population may be a fringe population taking advantage of artificial nesting sites present in the Maya ruins there. Miller & Miller (pers. com.) also noted a low breeding success at Caracol which might also be an indication that Caracol presents a sub-optimal habitat for this species. Extrapolating densities from the Upper Mullins River basin and the current survey to the entire Maya Mountain range (for this purpose estimated to be 160,000 ha, a population of 1,600 pairs of Keel-billed Motmots in Belize has to be considered realistic. This figure still makes this bird relatively uncommon although not as rare as indicated by Miller & Miller (1995). Taking into account the inhospitable character of the birds preferred habitat, plus the fact that most of its habitat lies within current protected areas, the conclusion must be that this species, at least in Belize, is not threatened.

The situation in other countries of Meso-America may be all together different. But only a few years ago, the only Keel-billed Motmot population known in Belize was the population at Caracol. Nowadays, with more naturalists trained to notice this species, many more and much denser populations are known. So it appears more than likely that directed surveys by people familiar with the call of the bird, may reveal several so far unknown populations in Central America, or even in Southern Mexico.



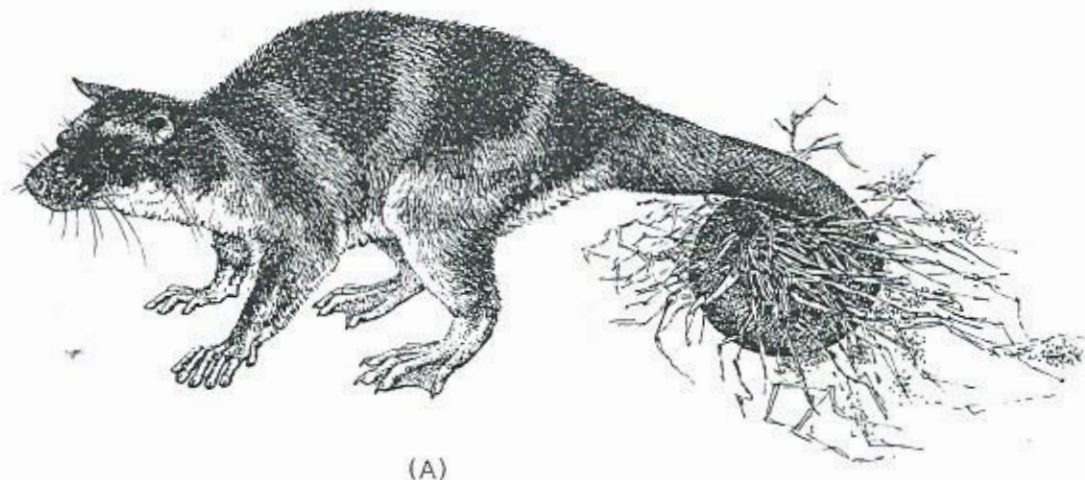


Figure 17. Water Opossum (carrying nesting material in tail).

### Mammals:

Taking into account that we traveled in a large, noisy, "pack" it was not surprising that we rarely encountered any Mammals. Most mammal records (Appendix 2, table 7.) are based on track observations. Guide Albert "Jonesey" Jones was an expert in locating and interpreting tracks. Tracks of Tapir and of large packs of "Warrie" or White-lipped Peccaries were frequently encountered. Also common were tracks and burrows of Water opossums (Fig. 17) which was also the one mammal that most team members managed to get a good look at. Bats were generally low in numbers but seen at virtually all camps. One good observation was that of 2 (different) "Gibnuts" or Paca's that were encountered on one of the nightwalks. Both animals could be approached to near touching distance.

## Archeology:

During the expedition, we never expected to encounter any signs of ancient Maya inhabitation. The Maya in Belize appear to have had a preference for limestone based soils and seeing the steep slopes along the Maya Mountain Divide, it was not difficult to reason why the Mayas never settled there. Still, on one occasion, on 21 January, just before reaching Squirrel Camp, we one of the team members found a little piece of weathered pottery in the stream. It can be argued that the Maya established trading routes over the Maya Mountain Divide and that this pot shard was a silent testimony of one of those routes. Clay pottery, however, must have a limited lifespan in rapid streams like these, so the shard must have entered the stream recently, possibly after it was unearthed by a treefall or other type of erosion.

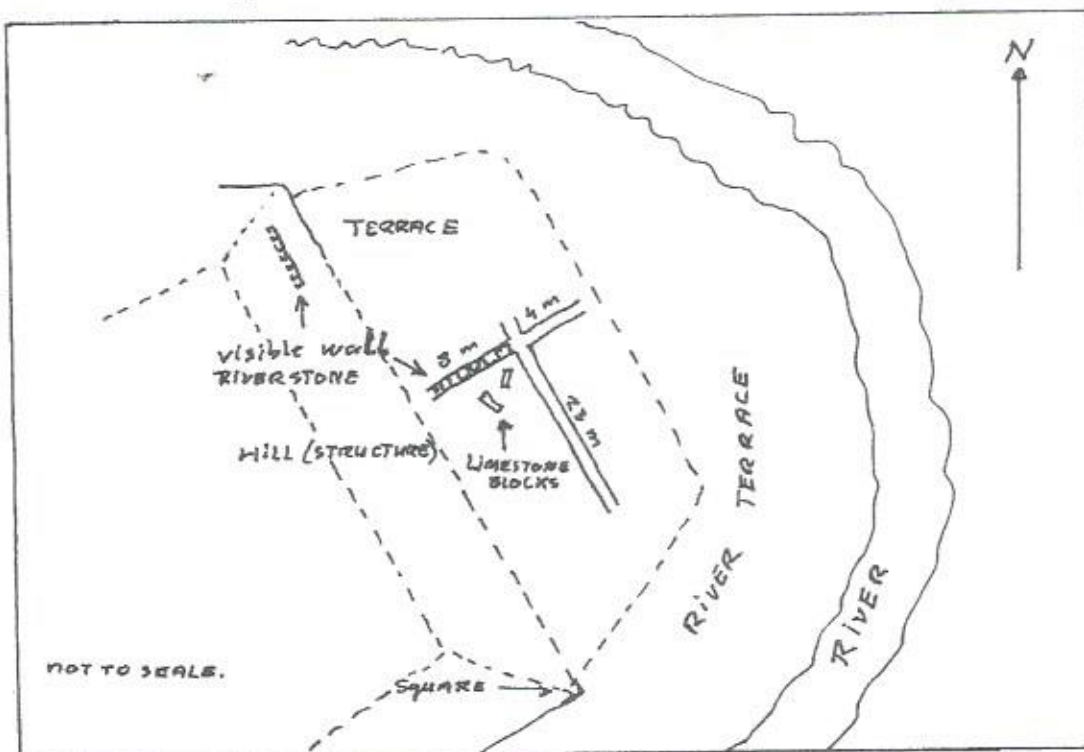


Figure 18. Sketch of Maya Ruin discovered by the Expedition, 28 January 1995.

To our surprise, we stumbled on a what appeared to be a fairly large ruin coming down the Snake Creek valley, while still on acid soils (Fig. 18). This ruin appeared undiscovered, unlooted and unresearched. Later, a little further down in the Snake Creek, on limestone based soils, we discovered many more Maya ruins (Fig. 19). Most of these ruins appeared to have received attention from archeologists. The high density and large size of the structures there amazed us all. Judging the large amount of ruins, this area must have been of high importance to the Maya civilization. Apparently the Maya's may have been mining the lower reaches of the Maya Mountain Divide for rare minerals which they used to make their paints etc. (R.Foster. pers.com.)



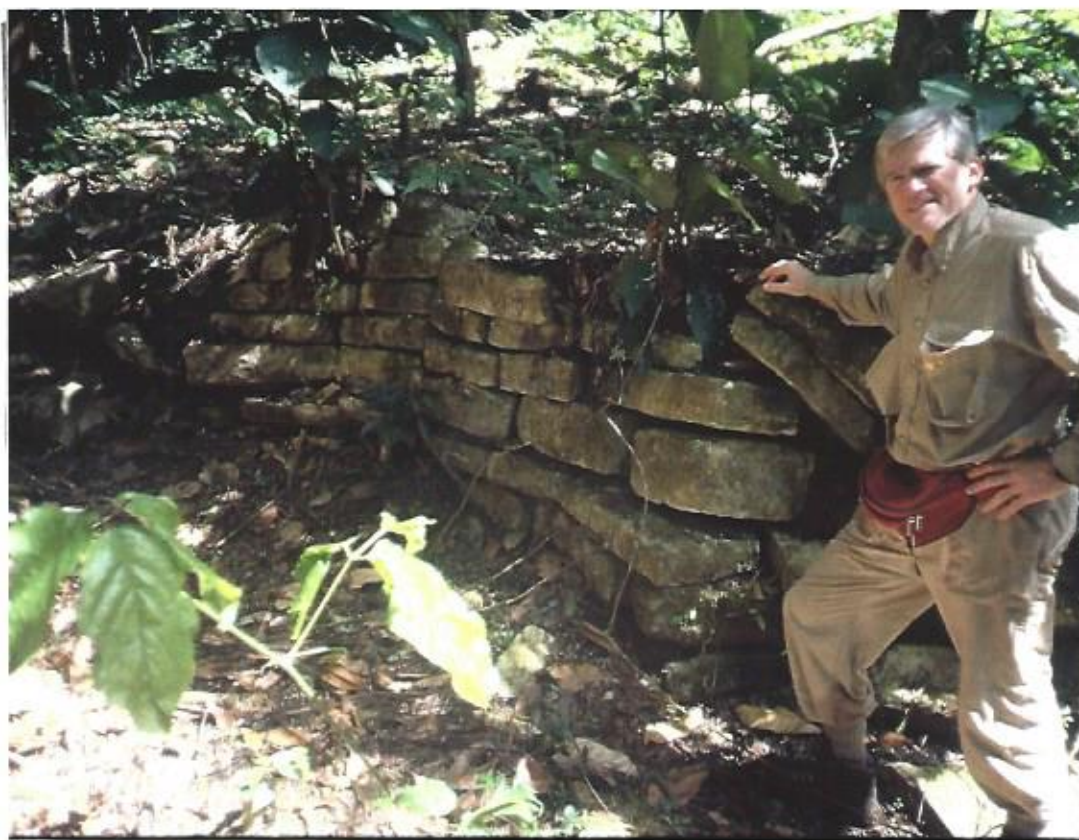


Figure 19. Author Gerald Williams at Maya Ruin, 29 January 1995.

### Conclusions

In spite of the fact that the expedition carried only one "multi-disciplinary" biologist, and the fact that an expedition like this, where you are constantly on the move, is not the best way to collect many data, the expedition as a whole has to be considered very successful. A large number of data on several aspects of both flora and fauna were collected.

The higher ridges of the Maya Mountain Divide were found to have a very distinct flora but a relatively poor species richness. The stream valleys just below the ridges were found to have a greater variety in this aspect. These stream valleys appear to contain a combination of species occurring on the exposed higher ridges and species that favor more sheltered conditions.

Several species new to Belize were collected and it may be assumed that more intensive biological work, again in the stream valleys just below the ridges, will reveal many more new and interesting species.

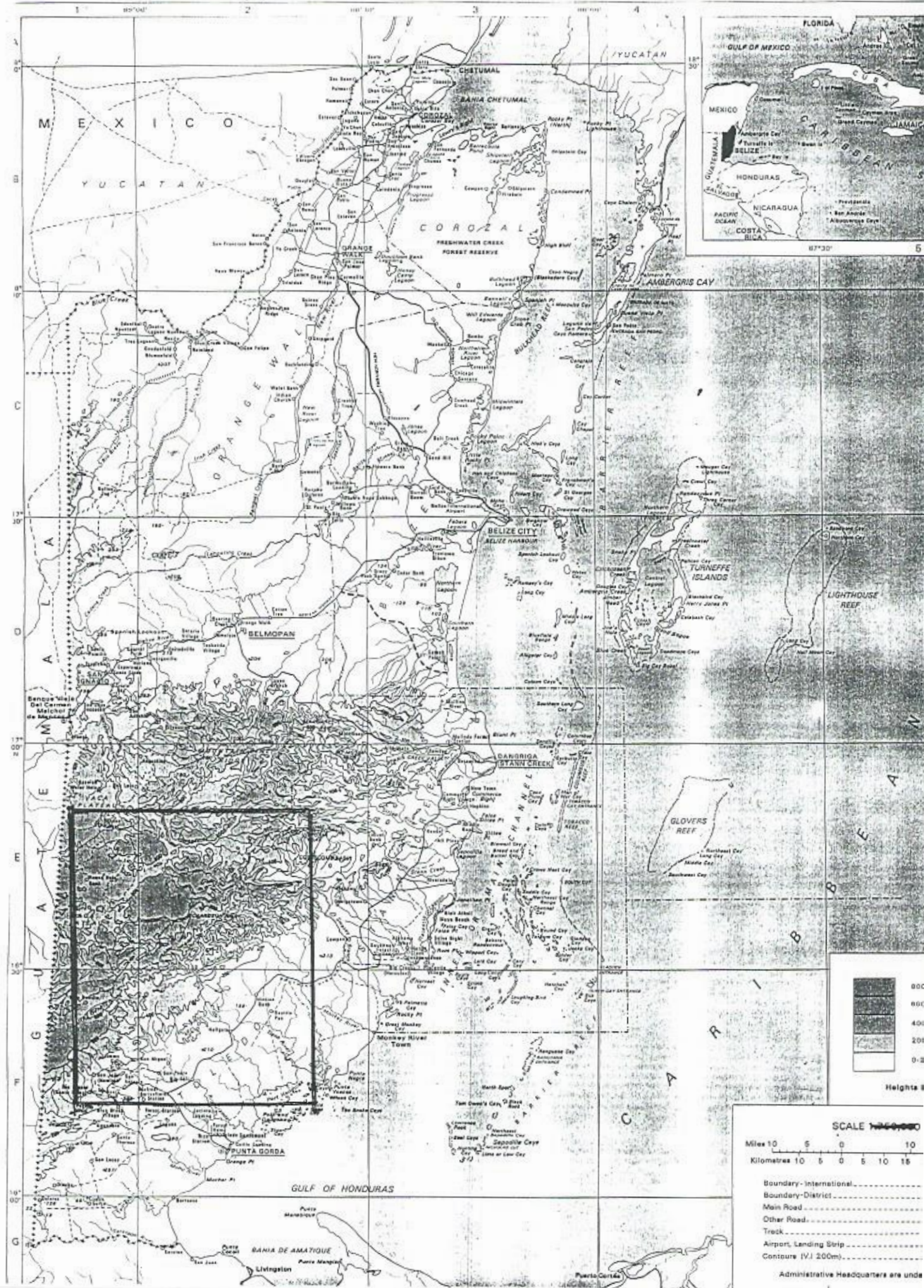
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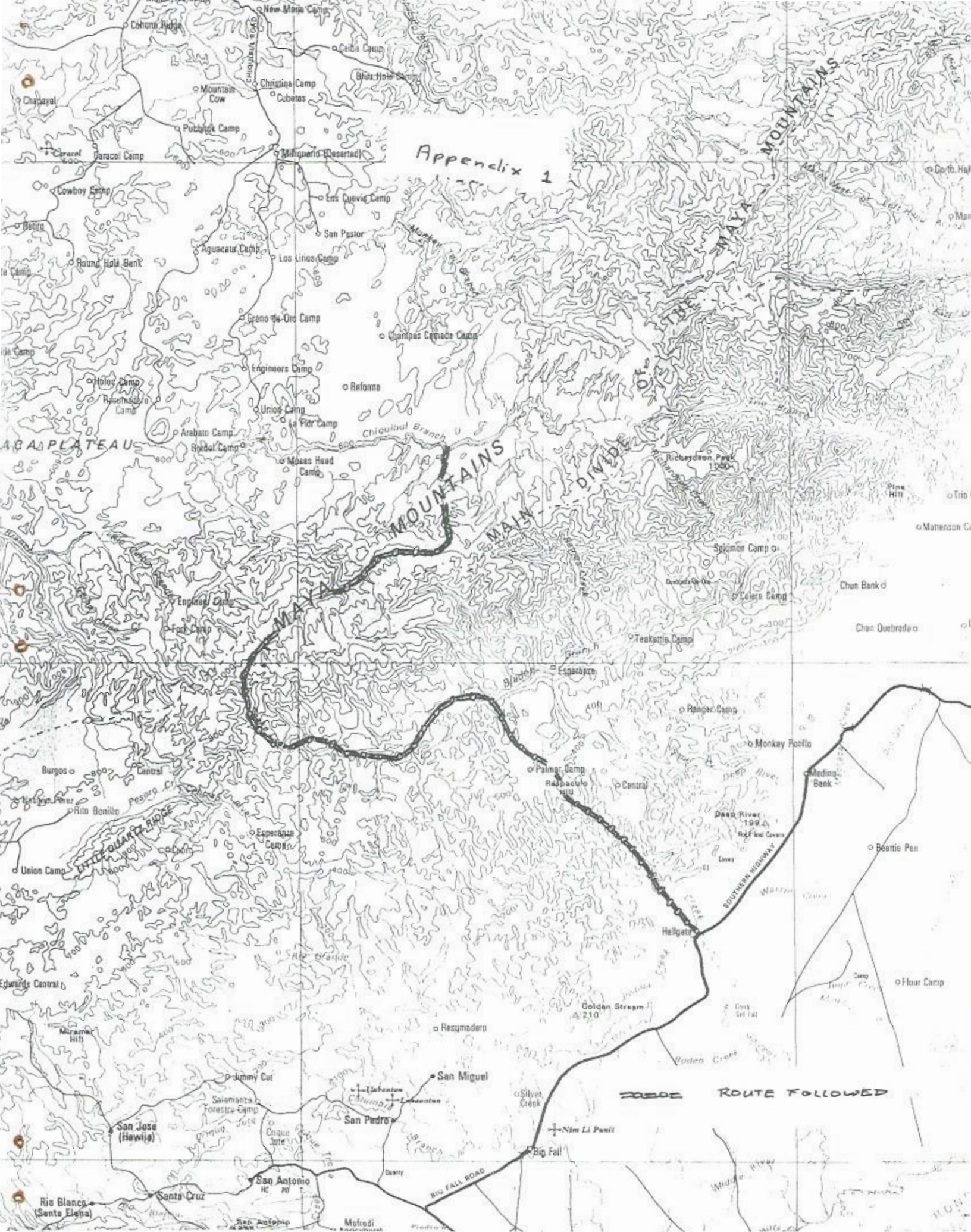


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Appendix 1

ROUTE FOLLOWED



Chart 1.  
Altitudes on the Maya Mountain Divide trek 1995

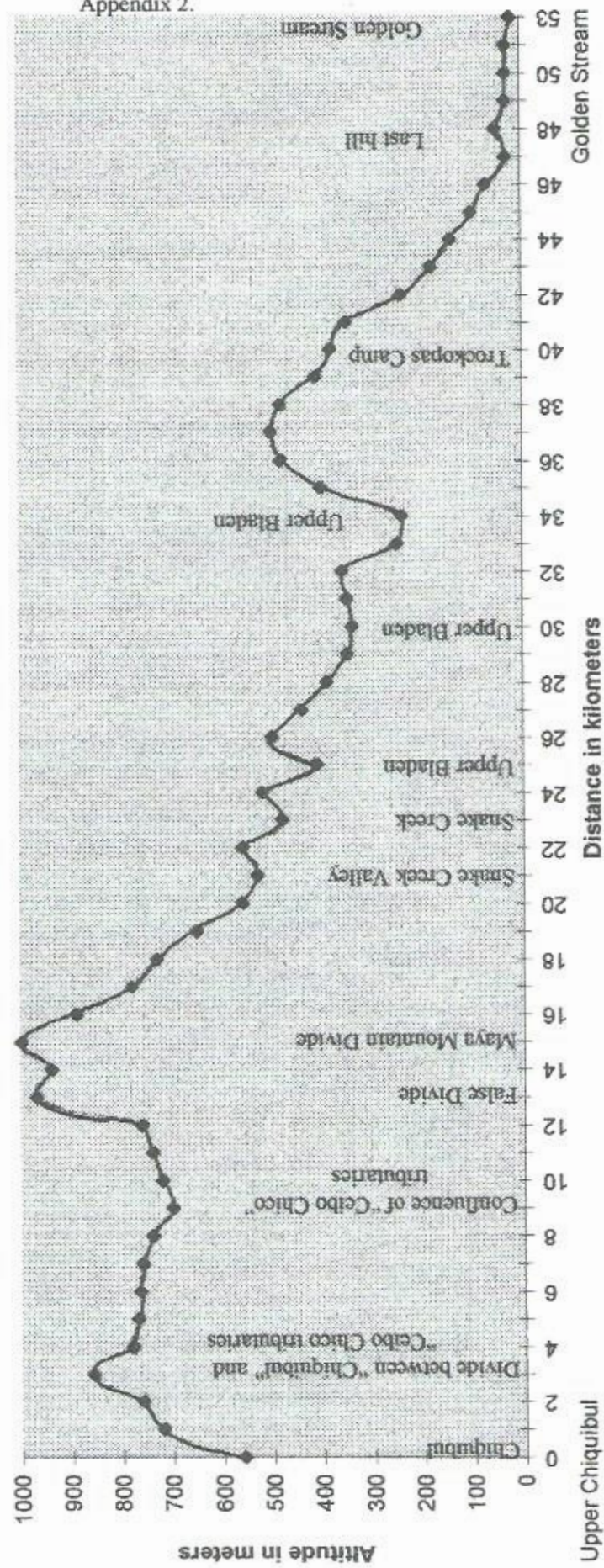






Table 1.

Date	Camp number	Altitude in m.	Name
			Asteraceae
			<i>Neurolaena lobata</i>
			Begoniaceae
			<i>Begonia heracleifolia</i>
			<i>Begonia</i> sp.
			<i>Begonia</i> sp. climbing
			<i>Begonia</i> sp. rounded leaf
			Bombacaceae
			<i>Ceiba pentandra</i>
			<i>Ochroma lagopus</i>
			Bromeliaceae
			<i>Androlepis skinneri</i>
			<i>Pitcairnia petiolata</i>
			Burseraceae
			<i>Bursera simaruba</i>
			Caesalpiniaceae
			<i>Bauhinia glauca</i>
			<i>Bauhinia guianensis</i>
			<i>Cassia cf. alata</i>
			<i>Dalium guianense</i>
			<i>Schizolobium parahybum</i>

C = Collected, S = Seen.









Table 1.  
Floristic notes of the Maya Mountain Divide trek 1995

Date	Camp number	Altitude in m.	Name	Chiquibul	16-1	17-1	2	18-1	Cockroach	Turn Back	20-1	Sandfly	21-1	Squirrel	22-1	Ketchup	False Divide	Divide	Eagle	Temple	Sinkhole	No water	Tick	Water hole	Catfish	Trockopas	G. Stream	19	3-2
			Magnoliaceae																										
			Magnolia sp.																										
			Malvaceae																										
			Malvaviscus arboreus																										
			Maranthaceae																										
			Calathea sp.																										
			Maranta sp.																										
			Meliceae																										
			Swietenia macrophylla																										
			Mimosaceae																										
			Inga edulis																										
			Inga sp.																										
			Mimosa pigra																										
			Mimosa pudica																										
			Pithecellobium "Linda hermosa"																										
			Moraceae																										
			Cecropia obtusifolia																										
			Cecropia peltata																										
			Ficus glabrata																										
			Ficus sp.																										
			Pourouma aspera																										

C = Collected, S = Seen.

Table 1.  
Floristic notes of the Maya Mountain Divide trek 1995

Date	Camp number	Altitude in m.	Name	Chichibul	16-1	17-1	18-1	19-1	20-1	21-1	22-1	23-1	24-1	25-1	26-1	27-1	28-1	Sinkhole	No water	Tick	Water hole	Catfish	Trockopas	G. Stream
			<b>Musaceae</b>																					
			<i>Heliconia aurantiaca</i>																					
			<i>Heliconia champneiana</i>																					
			<i>Heliconia mathiasiae</i>																					
			<b>Ochnaceae</b>																					
			<i>Ouratea</i> sp.																					
			<b>Orchidaceae</b>																					
			<i>Encyclia cochleata</i>																					
			<i>Encyclia pygmaea</i>																					
			<i>Lockhartia</i> nr. <i>integra</i>																					
			<i>Maxillaria</i> (eliator?)																					
			<i>Pleurothallis</i> nr. <i>cardiothallis</i>																					
			<i>Scaphyglottis prolifera</i>																					
			<i>Sobralia</i> sp.																					
			<b>Palmae</b>																					
			<i>Acrocomia mexicana</i>																					
			<i>Astrocaryum mexicanum</i>																					
			<i>Bactris</i> sp.																					
			<i>Chamaeodora</i> sp.																					
			<i>Colpothrinax cookii</i>																					
			<i>Crysophylla argentea</i>																					
			<i>Desmoncus schippii</i>																					
			<i>Euterpe macrospadix</i>																					

C = Collected, S = Seen.



Table 1.  
Floristic notes of the Maya Mountain Divide trek 1995

Date	Camp number	Altitude in m.	Name	Chiquibul	16-1	17-1	18-1	Cockroach	Turn Back	20-1	Sandfly	Squirrel	22-1	Ketchup	False Divide	Divide	25-1	Eagle	27-1	Temple	Sinkhole	No water	Trick	Water hole	Catfish	Trockopas	G. Stream
			Palmae cont.																								
			Geonoma ? single fl. spike																								
			Orbignya cohune																								
			Palm, ringed stem, tall																								
			Sabal morissiana																								
			Passifloraceae																								
			Passiflora adenopoda																								
			Passiflora ambigua																								
			Passiflora biflora																								
			Passiflora costaricensis																								
			Passiflora guatemalensis																								
			Passiflora helleri																								
			Passiflora mayarum																								
			Passiflora oerstedii																								
			Passiflora rovirosae																								
			Passiflora serratifolia																								
			Piperaceae																								
			Piper auritum																								
			Piper sp.																								
			Piper sp. large round leaves																								
			Piper sp. spade shaped leaves																								
			Pothomorphe peltata																								

C = Collected, S = Seen.

Table 1.

Date	Camp number	Altitude in m.	Name
			<b>Pocaea</b>
			Bamboo low
			Bamboo, tall, hirsute
			<i>Gynerium sagittatum</i>
			<b>Podocarpaceae</b>
			<i>Podocarpus guatemalensis</i>
			<b>Polygonaceae</b>
			<i>Coccoloba belizensis</i>
			<i>Coccoloba</i> sp. large leaved
			<b>Pteridophyta</b>
			<i>Bolbitis nicotianaefolia</i>
			<i>Lygodium</i> sp.
			<i>Polypodium</i> sp.
			<i>Thelypteris</i> sp.
			<b>Pyrolaceae</b>
			<i>Monotropa</i> sp.
			<b>Rubiaceae</b>
			<i>Cephaelis elata</i>
			<i>Cephaelis tomentosa</i>
			<i>Lindenia rivalis</i>
			<b>Rutaceae</b>
			<i>Zanthoxylum caribbeum</i>
			<i>Zanthoxylum</i> sp. 1

C = Collected, S = Seen.





Table 2.  
Odonata of the Maya Mountain Divide trek 1995

Date	16-1	17-1	18-1	19-1	20-1	21-1	22-1	23-1	24-1	25-1	26-1	27-1	28-1	29-1	30-1	31-1	1-2	2-2	3-2
Camp number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Altitude in m.	590	720	760	780	760	740	760	970	1000	780	780	560	530	480	410	350	250	410	20
Species/Camp name	Chiquibul	Hairy Palm	Cockroach	Turn Back	Sandfly	Squirrel	Ketchup	False Divide	Divide	Eagle	Temple	Sinkhole	No water	Tick	Water hole	Catfish	Trockopas	G. Stream	
Zygoptera																			
<i>Archilestes grandis</i>																			
<i>Argia oculata</i>																			
<i>Argia ulmeca</i>																			
<i>Argia (harknessi) ?</i>																			
<i>Hetaerina cruentata</i>																			
<i>Hetaerina capitalis</i>																			
<i>Heteragrion alienum</i>																			
Anisoptera																			
<i>Brechmorhoga rapax</i>																			
<i>Brechmorhoga tepeaca</i>																			
<i>Libellula herculea</i>																			

C = Collected, S = Seen.



Table 3.  
Lepidoptera of the Maya Mountain Divide trek 1995

Date	Camp number	Altitude in m.	Name
			<b>Papilionidae</b>
			<i>Papilio anchisiades</i>
			<i>Parides childrenae</i>
			<i>Parides sesostris</i>
			<b>Pieridae</b>
			<i>Aphrissa statura</i>
			<i>Archonias tereas</i>
			<i>Dismorphia amphione</i>
			<i>Dismorphia theucharilla</i>
			<i>Itaballia (pandusia?)</i>
			<i>Phoebis argente</i>
			<b>Nymphalidae: Charaxinae</b>
			<i>Consul electra</i>
			<i>Memphis sp.</i>
			<b>Nymphalidae: Nymphalinae</b>
			<i>Adelpha felderi</i>
			<i>Diaethria astala</i>
			<i>Hamadryas sp.</i>
			<i>Hypanartia lethe</i>
			<i>Marpesia chiron</i>
			<i>Siproeta epaphus</i>

Table 3.  
Lepidoptera of the Maya Mountain Divide trek 1995

Date	Camp number	Altitude in m.	Name	Chiquibul	16-1	17-1	18-1	Cockroach	19-1	Turn Back	20-1	Sandfly	21-1	Squirrel	22-1	Ketchup	23-1	False Divide	24-1	25-1	26-1	27-1	Temple	28-1	Sinkhole	29-1	No water	410	30-1	31-1	Water hole	16	17	18	19
			<b>Nymphalidae: Heliconiinae</b>																																
			<i>Dione juno</i>	S																															
			<i>Eueides alipha</i>																																
			<i>Eueides procula</i>																																
			<i>Heliconius charitonus</i>																																
			<i>Heliconius cydno</i>	S			C																												
			<i>Heliconius erato</i>																																
			<i>Heliconius hecalesia</i>																																
			<i>Heliconius ismenius</i>																																
			<i>Heliconius sapho</i>																																
			<i>Heliconius sapho/cydno</i>																																
			<i>Laparus doris</i>																																
			<b>Nymphalidae: Ithomiinae</b>																																
			<i>Aeria eurimedia</i>																																
			<i>Callithomia hezia</i>																																
			<i>Dircenna dero</i>																																
			<i>Godrys zavelata</i>																																
			<i>Greta nero</i>																																
			<i>Hypoleia cassotis</i>																																
			<i>Hyposcada virginiana</i>																																
			<i>Ithomia patilla</i>																																
			<i>Mechanitis polymnia</i>																																
			<i>Pteronymia cotyto</i>																																
			<i>Pteronymia fizzle</i>																																

C = Collected, S = Seen, H=Heard, T=Tracks or other signs, L=Larvae



Table 3.  
Lepidoptera of the Maya Mountain Divide trek 1995

Date	Camp number	Altitude in m.	Name	Chiquibul	16-1	17-1	2	3	18-1	19-1	4	20-1	5	21-1	6	22-1	7	23-1	8	False Divide	1000	9	25-1	26-1	10/11	27-1	12	560	530	480	410	350	16	1-2	17	250	410	18	20	3-2					
				G. Stream																																									
				Trockopas																																									
				Catfish																																									
				Water hole																																									
				Tick																																									
				No water																																									
				Sinkhole																																									
				Temple																																									
				Eagle																																									
				Divide																																									
				False Divide																																									
				Ketchup																																									
				Squirrel																																									
				Sandfly																																									
				Turn Back																																									
				Cockroach																																									
				Haiky Palm																																									
				Chiquibul																																									
				Nymphalidae: Melitaeinae																																									
				Anthanassa ardys																																									
				Castilia eranitis																																									
				Chlosyne gaudealis																																									
				Nymphalidae: Brassolinae																																									
				Caligo uranus																																									
				Nymphalidae: Morphinae																																									
				Antirhea militiades																																									
				Morpho peleides																																									
				Nymphalidae: Satyrinae																																									
				Cissia hermes																																									
				Cissia metaleuca																																									
				Cissia ocirrhoe																																									
				Euptychia westwoodi																																									
				Riodinidae																																									
				Leucochymona vestalis																																									
				Mesosemia gaudeolum																																									
				Mesosemia lamachus																																									
				Miscellaneous																																									
				Lycaenidae sp.																																									
				Hesperiidae sp.																																									
				Moth blue																																									
				Moth orange																																									
				Moth Heliconius sapho mimic																																									

C = Collected, S = Seen, H=Heard, T=Tracks or other signs, L=Larvae

Table 4.  
Amphibians on the Maya Mountain Divide trek 1995

Date	Camp number	Altitude in m.	Species/Camp name
			<b>Caudata: Salamanders</b>
			<i>Bolitoglossa</i> sp. brown
			<i>Bolitoglossa</i> sp. yellow stripes
			<b>Anura: Frogs and Toads</b>
			<i>Achalychnis</i> sp.
			<i>Bufo campbelli</i>
			<i>Bufo marinus</i>
			<i>Eleutherodactylus</i> chac
			<i>Eleutherodactylus</i> rugulosus
			<i>Eleutherodactylus</i> sandersoni
			<i>Hyalinobatrachium fleischmanni</i>
			<i>Leptodactylus melanonotus</i>
			<i>Rana juliani</i>
			<i>Rana vaillantii</i>

C = Collected, S = Seen, H = Heard, T = Tracks or other signs.









Table 6.  
Birds of the Maya Mountain Divide trek 1995

Date	Camp number	Altitude in m.	Camp/species name	16-1	17-1	18-1	19-1	20-1	21-1	22-1	23-1	24-1	25-1	26-1	27-1	28-1	29-1	30-1	31-1	1-2	2-2	3-2
				Chiquibul	590	1																
				Haiky Palm	720	2																
				Cockroach	760	3																
				Turn Back	780	4																
				Sandfly	760	5																
				Squirrel	740	6																
				Ketchup	760	7																
				False Divide	970	8																
				Divide	1000	9																
				Eagle	780	10																
				Temple	560	12																
				Sinkhole	530	13																
				No water	480	14																
				Tick	410	15																
				Water hole	350	16																
				Catfish	250	17																
				Trockopas	410	18																
				G. Stream		20																
						19																
			<b>Parrots</b>																			
			Brown headed Parrot																			
			Mealy Parrot																			
			Olive throated Parakeet																			
			Red lored Parrot																			
			White crowned Parrot																			
			<b>Cuckoos</b>																			
			Squirrel Cuckoo																			
			<b>Typical Owls</b>																			
			Mottled Owl																			
			<b>Goatsuckers</b>																			
			Tawny collared Nightjar																			
			Common Pauraque																			
			<b>Swifts</b>																			
			Swifts																			
			<b>Hummingbirds</b>																			
			Common Woodnymph																			
			Long tailed Hermit																			
			Purple crowned Fairy																			
			Stripe tailed Hummingbird																			
			Violet Sabrewing																			
			<b>Trogon</b>																			
			Slaty tailed Trogon																			
			Violaceous Trogon																			

C = Collected, S = Seen, H=Heard, T=Tracks or other signs.





Table 6.  
Birds of the Maya Mountain Divide trek 1995

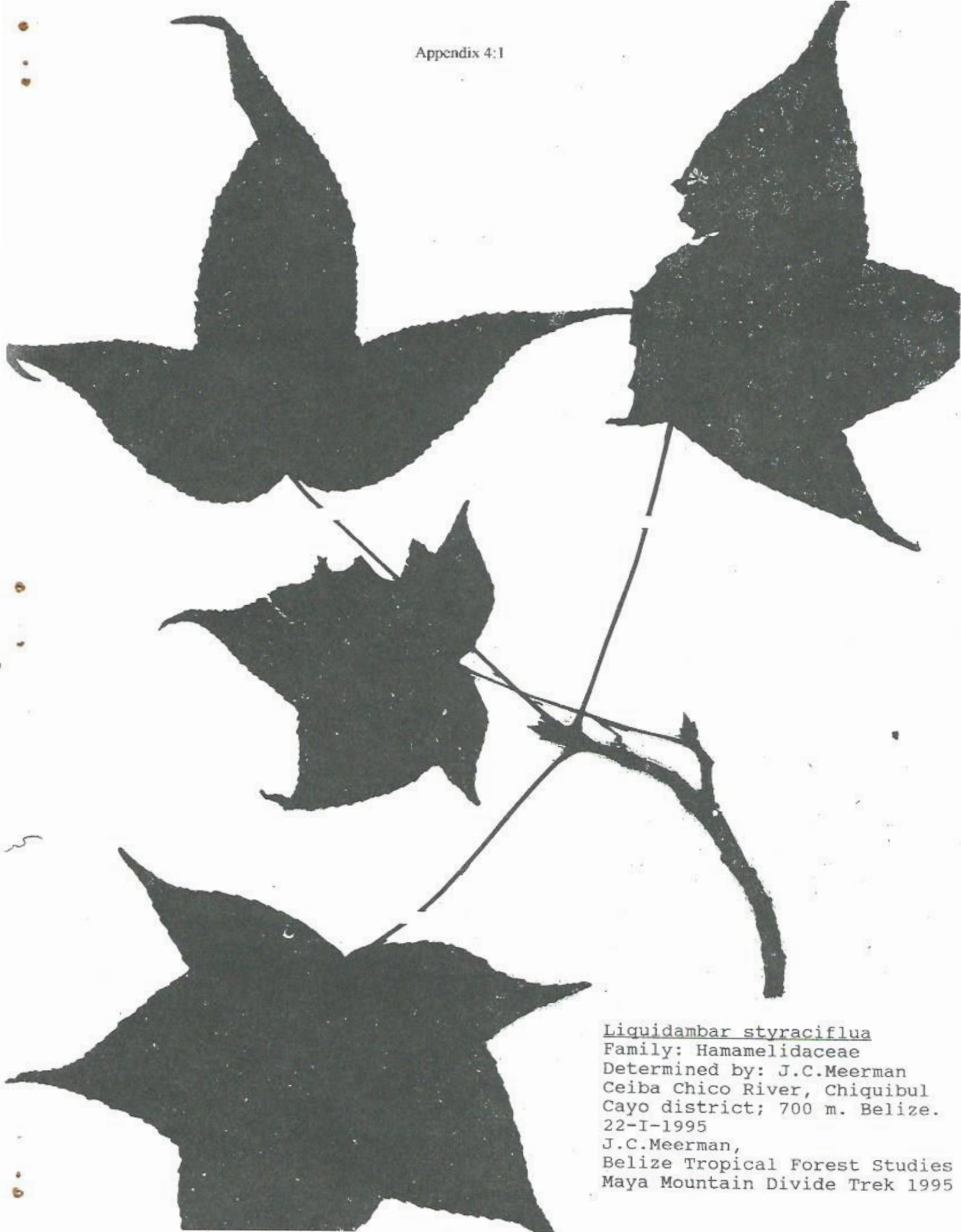
Date	Camp number	Altitude in m.	Camp/species name
			G. Stream
			Trockopas
			Catfish
			Water hole
			Tick
			No water
			Sinkhole
			Temple
			Eagle
			Divide
			False Divide
			Ketchup
			Squirrel
			Sandfly
			Turn Back
			Cockroach
			Hairy Palm
			Chiquibul
			Jays
			Wrens
			Northern Nightingale Wren
			Solitaires and Thrushes
			Slate colored Solitaire
			Wood Thrush
			Wood Warblers
			Hooded Warbler
			Kentucky Warbler
			Louisiana Waterthrush
			Magnolia Warbler
			Tanagers
			Green Honeycreeper
			Olive backed Euphonia
			Red throated Ant Tanager
			Yellow throated Euphonia
			Embrizine Sparrows
			Orange Billed Sparrow
			Blackbirds and Allies
			Black headed Oriole
			Chesnut headed Oropendula
			Montezuma Oropendula

C = Collected, S = Seen, H=Heard, T=Tracks or other signs.

Table 7.  
Mammals of the Maya Mountain Divide trek 1995.

Date	Camp number	Altitude in m.	Camp/species name
16-1	1	590	Chiquibul
17-1	2	720	Hairy Palm
18-1	3	760	Cockroach
19-1	4	780	Turn Back
20-1	5	760	Sandfly
21-1	6	740	Squirrel
22-1	7	760	Ketchup
23-1	8	970	False Divide
24-1	9	1000	Divide
25-1		780	Eagle
26-1	10	780	Eagle
27-1	12	560	Temple
28-1	13	530	Sinkhole
29-1	14	480	No water
30-1	15	410	Tick
31-1	16	350	Water hole
1-2	17	250	Catfish
2-2	18	410	Trockopas
3-2	19	20	G. Stream
<b>Marsupials</b>			
Water Opossum			
<b>Bats</b>			
Bats (Chiroptera) unid.			
<b>Primates</b>			
Black Howler Monkey			
<b>Carnivores</b>			
Jaguar/Puma			
Jaguarundi			
Ocelot			
Coati			
Kinkajou			
Southern River Otter			
<b>Odd toed Ungulates</b>			
Baird's Tapir			
<b>Even toed Ungulates</b>			
Brocket Deer			
White lipped Peccary			
White tailed Deer			
<b>Rodents</b>			
Paca			
Squirrel unid.			





Liquidambar styraciflua

Family: Hamamelidaceae

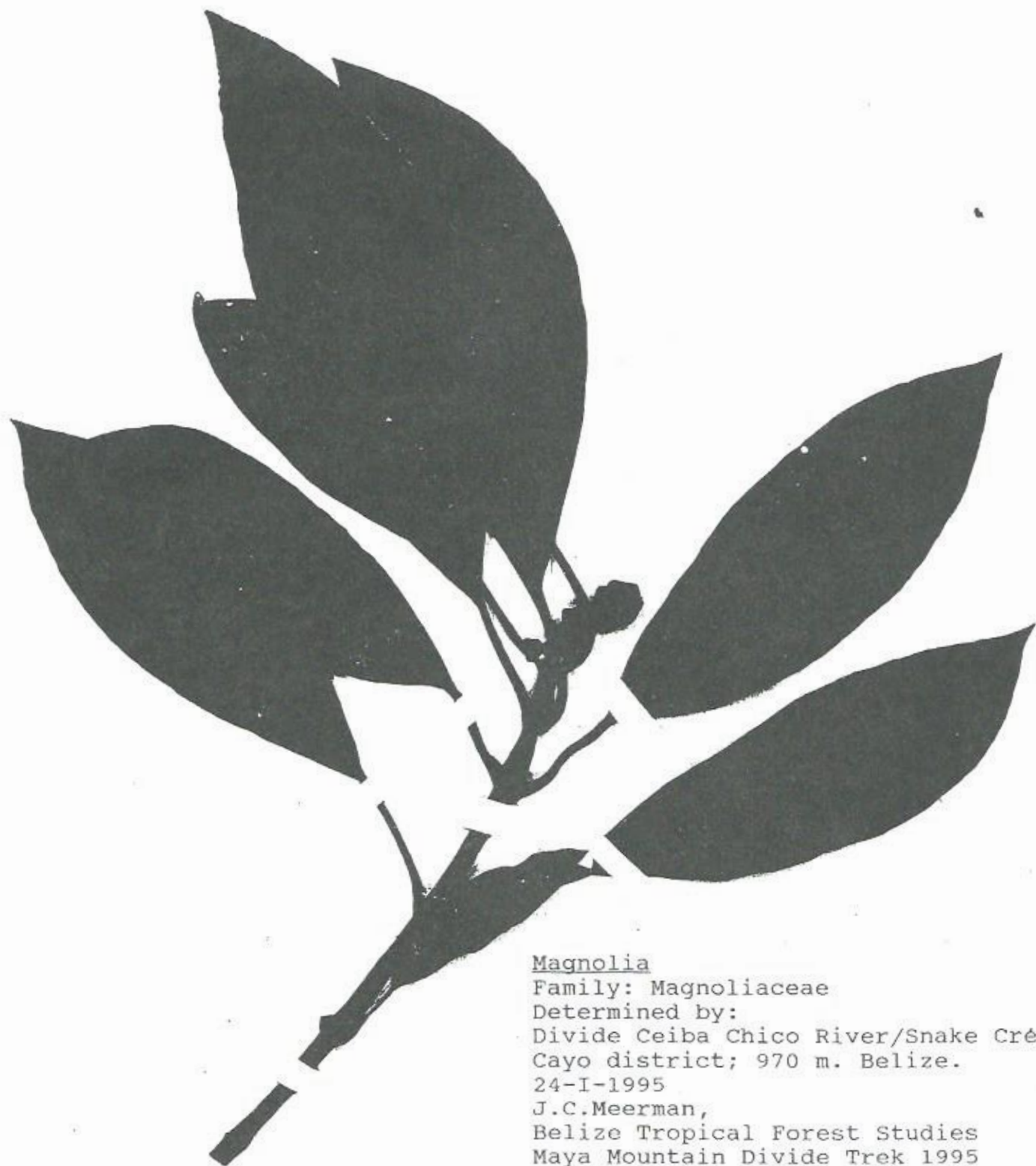
Determined by: J.C.Meerman

Ceiba Chico River, Chiquibul  
Cayo district; 700 m. Belize.

22-I-1995

J.C.Meerman,

Belize Tropical Forest Studies  
Maya Mountain Divide Trek 1995



Magnolia

Family: Magnoliaceae

Determined by:

Divide Ceiba Chico River/Snake Creek

Cayo district; 970 m. Belize.

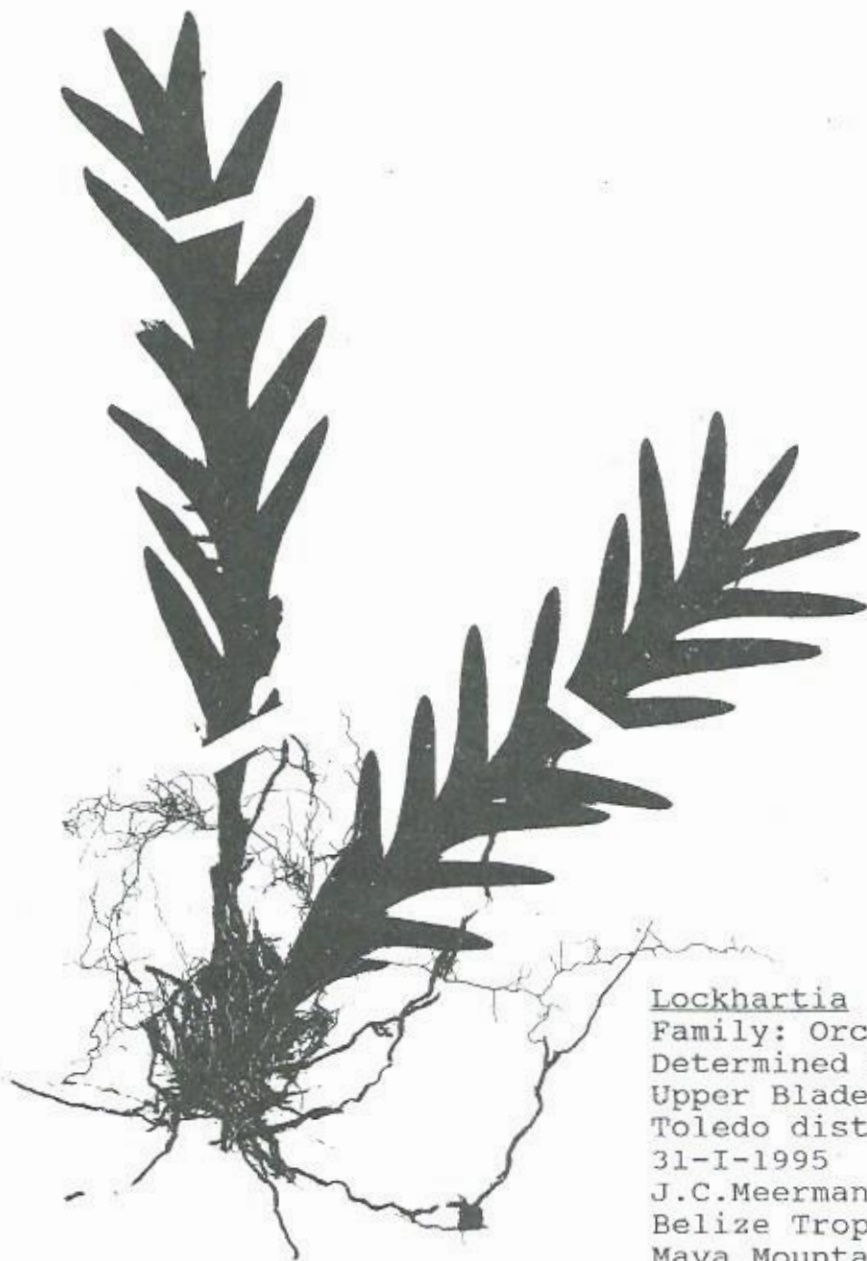
24-I-1995

J.C.Meerman,

Belize Tropical Forest Studies

Maya Mountain Divide Trek 1995





Lockhartia

Family: Orchideaceae

Determined by:

Upper Bladen

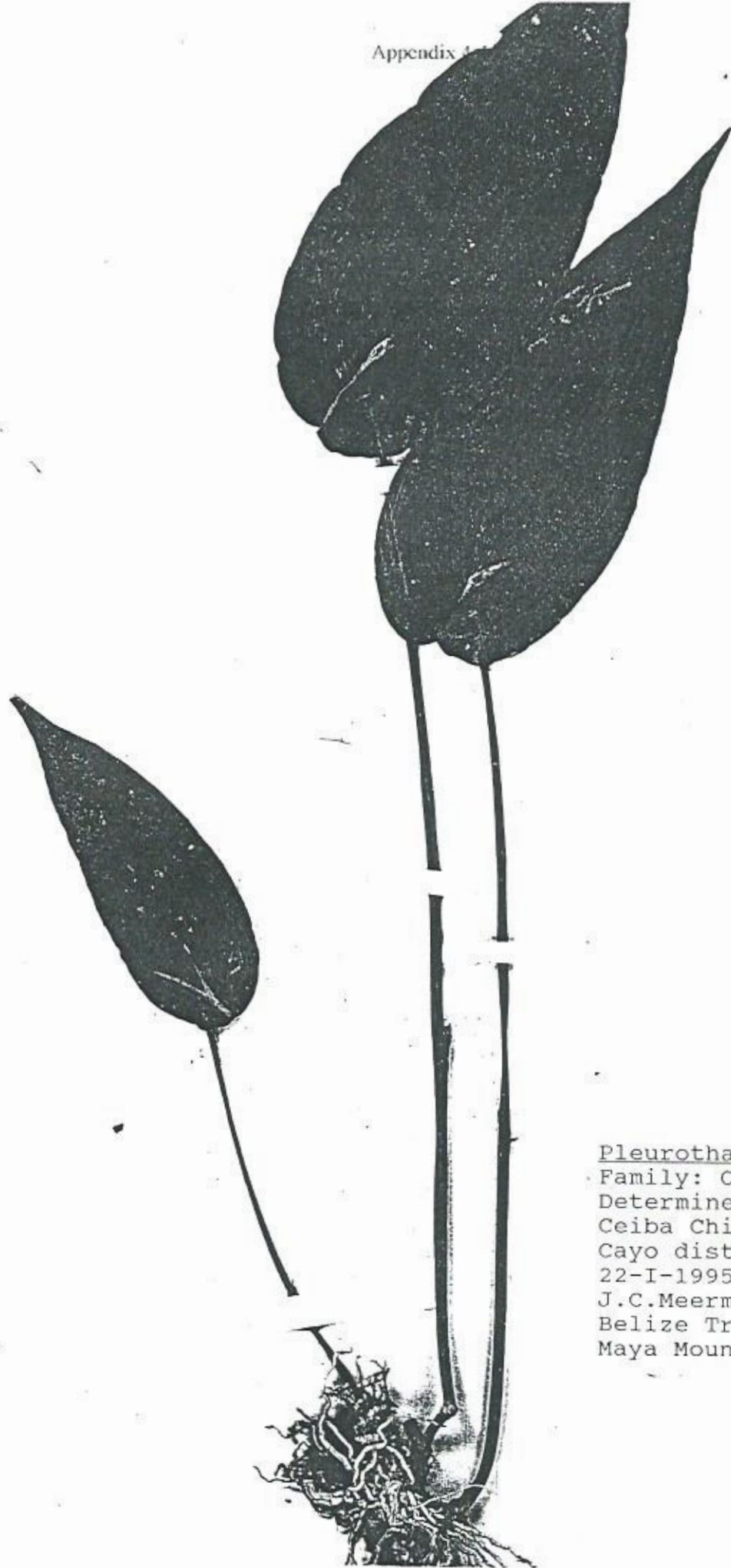
Toledo district; 340 m. Belize.

31-I-1995

J.C.Meerman,

Belize Tropical Forest Studies

Maya Mountain Divide Trek 1995



Pleurothallus

Family: Orchidaceae

Determined by:

Ceiba Chico River, Chiquibul

Cayo district; 740 m. Belize.

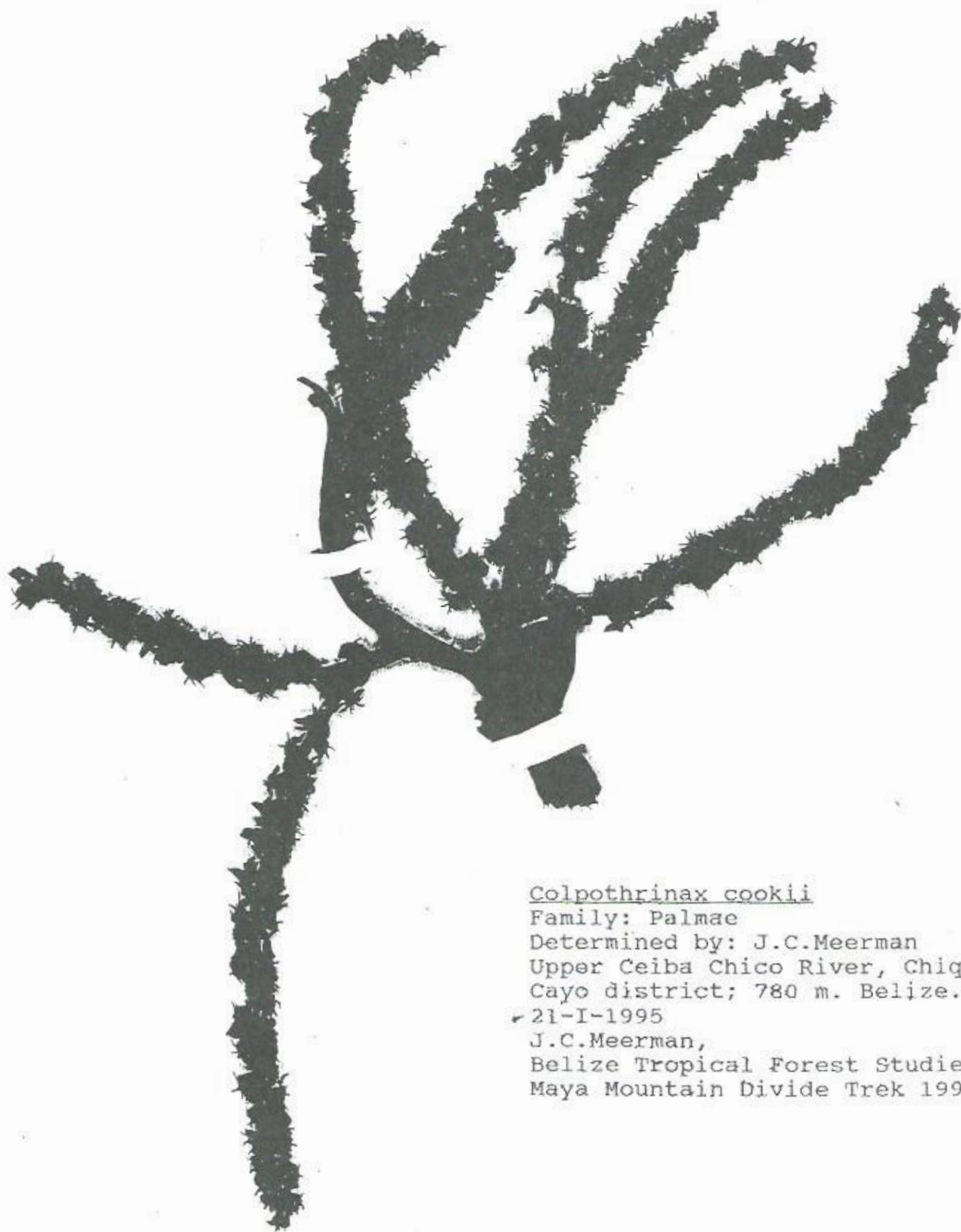
22-I-1995

J.C.Meerman,

Belize Tropical Forest Studies

Maya Mountain Divide Trek 1995





Colpothrinax cookii

Family: Palmae

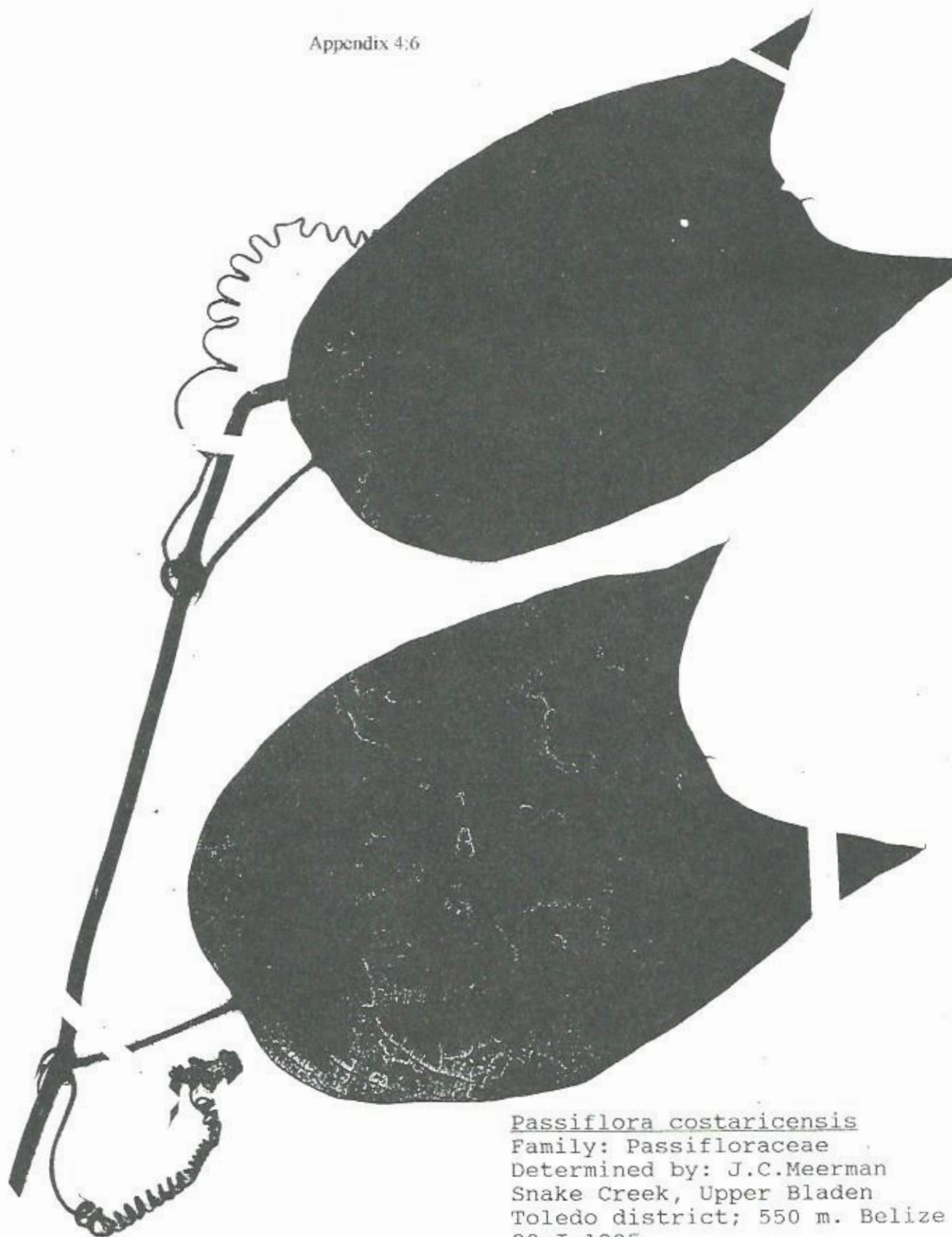
Determined by: J.C.Meerman

Upper Ceiba Chico River, Chiquibul  
Cayo district; 780 m. Belize.

✓ 21-I-1995

J.C.Meerman,

Belize Tropical Forest Studies  
Maya Mountain Divide Trek 1995



Passiflora costaricensis

Family: Passifloraceae

Determined by: J.C.Meerman

Snake Creek, Upper Bladen

Toledo district; 550 m. Belize

28-I-1995

J.C.Meerman,

Belize Tropical Forest Studies

Maya Mountain Divide Trek 1995



Passiflora helleri

Family: Passifloraceae

Determined by: J.C.Meerman

Snake Creek, Upper Bladen

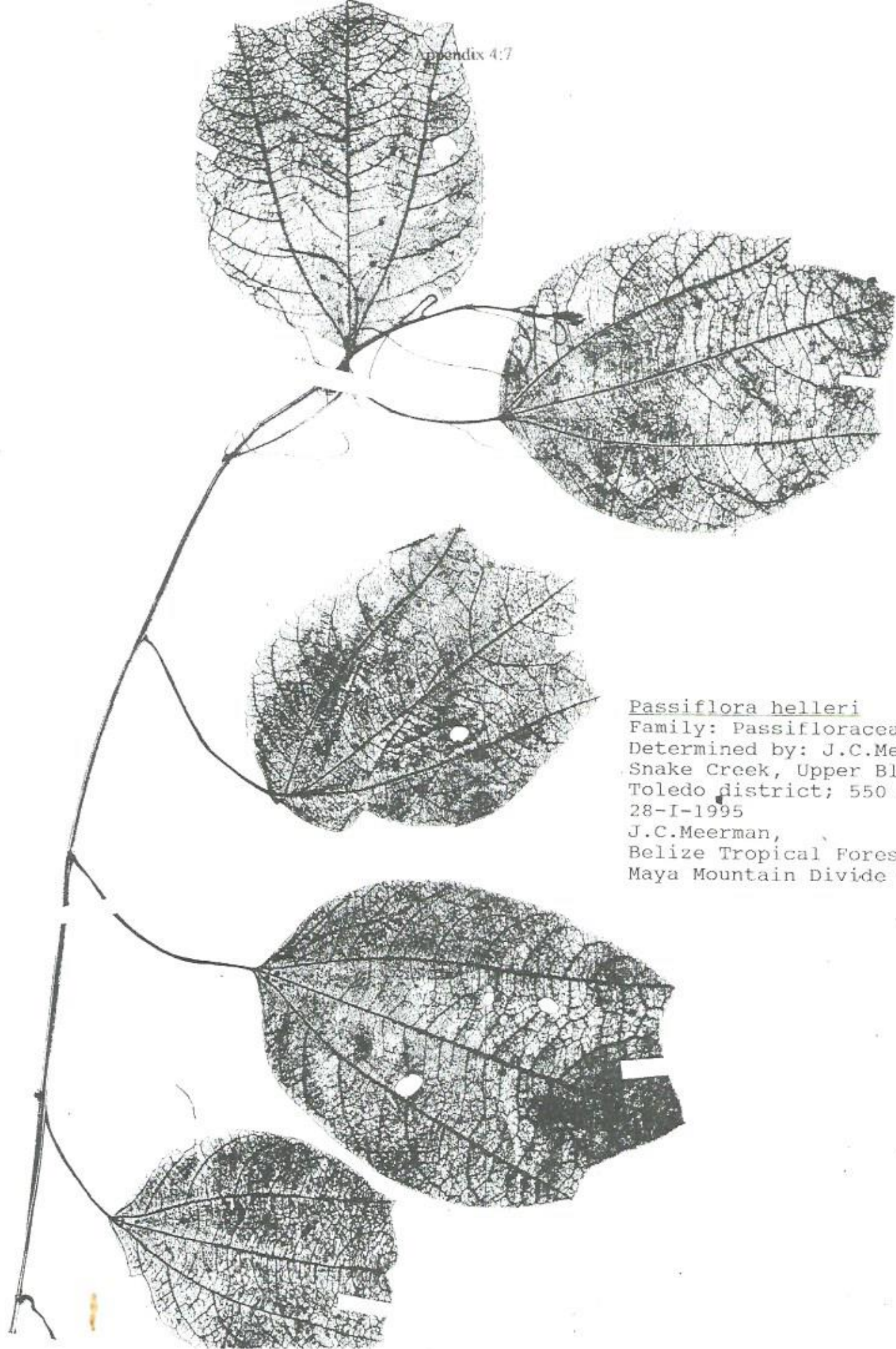
Toledo district; 550 m. Belize

28-I-1995

J.C.Meerman,

Belize Tropical Forest Studies

Maya Mountain Divide Trek 1995



	Camp	Easting	Northing	
17	1 Chiquibul Camp	294800	1837000	hel
		294750	1835550	
18	2 Hairy Palm Camp	294700	1834100	
		294650	1833300	
19	3 Cockroach Camp	294600	1832500	
		292500	1831450	
20	4 Turn Back Camp	290400	1830400	
		290450	1830350	
21	5 Sandfly Camp	290500	1830300	
		290250	1829850	
22	6 Squirrel Camp	290000	1829400	P. amb
		288250	1828700	A. schip
23	7 Ketchup Camp	286500	1828000	
		285650	1827250	A. schip
24	8 False Divide Camp	284800	1826500	
		284650	1826400	
25	9 Real Divide Camp	284500	1826300	
		284100	1825350	
26 27	10 Eagle Camp	283700	1824400	
		284150	1823100	
28	11 Temple Camp	284600	1821800	
		284900	1821200	A. s. bif cost hel over sea
29	12 Sinkhole Camp	285200	1820600	A. s. P. amb
		286100	1820950	
30	13 No Water Camp	287000	1821300	
		287850	1821050	
31	14 Tick Camp	288700	1820800	P. amb bif. hel sea
		290650	1821500	hel
	15 Waterhole Camp	292600	1822200	
		294200	1823200	P. ad
32	16 Catfish Camp	295800	1824200	A. s. P. ad
		298450	1821950	
33	17 Trockopass Camp	301100	1819700	
		304450	1814750	P. amb bif sea
34	18 Golden Stream	307800	1809800	P. amb bif quak ROU sea



Publications of Belize Tropical Forest Studies:

- #1. Meerman, J.C. & T.Boomsma, 1995. Tapir Mountain Nature Reserve, Cayo district, Belize. Biological Survey, 1994. 27 pp.
- #2. Meerman, J.C. & T.Boomsma, 1995. False Sittee Point Biological and Physical Survey, Stann Creek district, Belize. 45 pp.
- #3. Meerman, J.C. & G.Williams, 1995. Maya Mountain Traverse Expedition, January 16 - February 4, 1995. Biological report. 45 pp, 7 App.