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# Raphia

The newsletter of the Canadian Organization for  
Tropical Education and Rainforest Conservation



Volume 6 No. 3  
Fall 1997

ISSN 1188-7425

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## Careful, They are on the Move!

by Pat Opay, Scientific Officer at Cano Palma

Almost instantly, hundreds of ants appear. And yes, they bite, often quite ferociously. As if on search and retrieve missions, these well organized and cooperative creatures scan the environment for whatever might be edible.

Ants are an impressive group of insects and their invasions make quite an impression on visitors to the tropical forests. E.O. Wilson tells us that social insects are the most abundant organisms on earth, and among the social insects, ants are the dominant subgroup. According to Wilson there are some 20,000 or more species of ants living in habitats from the Arctic Circle to the tip of South America. In the Amazon rain forest, ants make up more than 10 percent of the biomass of all animals.

The Army Ant is a well known tropical species, and they can be found in the tropical wet forest of Tortuguero. The ants move in well-ordered columns when going from one place to another. They are committed to following the trail, and they are not easily distracted in their journey. However, their hunt for food is not so linear. When they decide to search for food, they spread out in a wide path, searching for something valuable to carry away. Creatures lying in their path know they have no choice but to move, at least if they know what is good for them. Sometimes they make frantic efforts to escape the voracious tide. So much so that there are birds that specialize in following Army Ants, as they know that wherever the ants go, plenty of insects and other creatures are sure to move out of their way. As they move, they become easier prey for the birds, rather like a moving smorgasbord!

When ants invade the station, they often enter our kitchen and dining area. What does one do, you may ask? Well, quite simply, one lets them in! While the ants' visit is likely to disrupt our day, they generally do not stay too long as they are usually passing through, not trying to find

lodging for the night! And don't forget, these little guys are just looking for food, and this is actually a hidden benefit. How? They remove pieces of whatever dead insects may be laying around in the nooks and crannies of the building, a sort of a free house cleaning service!

Ants are certainly a fascinating group of insects. Their organization, coordination of activity, and their obvious success as a taxonomic group is impressive. They are important in the tropical ecosystem. While certain creatures fear them, to others like the ant birds which follow them as they feed they are useful friends. The Army Ant of Tortuguero is another of the many species depending on conservation efforts to save their habitats. They aren't furry, they certainly aren't cute, but they are important, and your support of the station is helping to find ways to help them. Thank you!

## A RESEARCH STUDY AT CAÑO PALMA BIOLOGICAL STATION

by Bruce Duthie  
Pitt Meadows, British Columbia, Canada

Before I begin discussing the study I worked on this summer at Caño Palma Biological Station, I would like to mention a few personal sensations experienced upon my arrival. The abundance and diversity and life that engulfs one as the small motorboat skips across the canal, then slowly meanders through the fragility of the lowland wet forest seemingly stops time for a brief moment. The sounds heard from the depths of the forests represent history, life and sadly, danger. However, when you begin to understand a little bit about the ecology of the area, one of the most noticeable qualities is the balance of events. Seemingly nothing is wasted. What appears to be a decaying leaf or a lonely piece of beached driftwood really is a home to life easily unnoticed by the naked human eye. This is why understanding biology and ecology at all levels is essential for the safety, preservation and ultimate fate of the precious life that inhabits earth.

If one were to place the purpose of life under a microscope, the immediate image seen is to reproduce. Makes sense. Now, if you change lenses and look into the image under a higher magnification, a new catalogue of features appears. Features displaying patterns of allocating energy and efficiency become clearer on the prepared slide. For my purposes, this is the highest magnification I began to analyse with the limited time and lenses I had to work with - lenses representing equipment and knowledge. Let's begin discussing the main purpose of my trip to Caño Palma - some behavioural patterns in *Dendrobates pumilio*, the strawberry poison-arrow frog, keeping in mind the importance of efficient use of time and energy.

*D. pumilio* is a small frog, usually found at elevations below 500 metres in the rain forest on the Caribbean side of Nicaragua, Costa Rica and Panama. The colour patterns I noticed varied slightly between bright reddish orange bodies with characteristic blue pyjama bottoms and simply just bright reddish orange covering the entire body. The reasons for colour variations go beyond the scope of this article. Basically, if you have never seen a *D. Pumilio*, or a picture of one, imagine a jewel-like body, hopping across the intricate forest floor frantically or patiently perched on a small leaf or branch.

It took me awhile to eventually target a particular feature to study, but the more I became comfortable with the forests, the easier it became to narrow my range of ideas. I decided to focus on some behavioural patterns in *D. Pumilio* with respect to surrounding noises.

*D. pumilio* communicate between each other by calling. There are several different calling patterns used to communicate various messages. For example, advertisement calls differ from aggression calls, which differ from alarm calls, which differ from distress calls, and so on. In order for successful messages to be received then responded to, they must be understood. And for any message to be understood, whether it is between two frogs, or two people talking on the telephone, the message must be heard. After the message is heard, there is a decision to be made by the recipient -- how do I respond? When one initially thinks of a type of response, a vocal or physical action tends to come to mind. However, in some situations, the 'best' response to a signal may simply be, not to respond at all.

The surrounding noises within a complex ecosystem result in a continuous competition for air space between those species using calling as their main mechanism for relaying information between each other. When the patterns of calls were studied in the *D. pumilio*, I began to see some apparent trends. For example, when I used a recorded playback of two male frogs calling back and forth and placed this in a third male's territory, the 'resident' frog generally did not call back. Before I jumped to any conclusions, I ran this same situation on approximately sixty different male 'residents'. The results suggest that if air space in the immediate area were saturated with other noises, it would not be efficient for the 'resident' frog to call.

When I ran the playback using the sound of only one frog, the 'resident' frog showed immediate signs of aggression both physically and vocally. Actually, this little scenario amused me, as I am sure it has others who have run into the same situation. I observed the 'resident' male approach the single playback recording, then once the sound was isolated, and the frog actually would jump on top of the recorder, and continue aggressively calling and bouncing around the speaker. Despite the 'seriousness' of territory defence, I must admit, witnessing a one and half-centimetre red frog bouncing ferociously on a Sony tape recorder was rather amusing. As a means of control, I had the same recording device running without any calls, as well.

Overlapping calls cause no response, yet one call causes an aggressive response in the 'resident' male's behaviour. Why is this so? I can only speculate. When a resident frog hears a single intruder approaching his territory, he will acknowledge himself via an aggression call. This will warn the intruder. The intruder will then respond to the resident's call vocally, physically or both. The confrontation usually lasts for about fifteen minutes. The results of these confrontations tend to favour the 'resident' frogs.

Let's mention some possible reasons as to why the outcomes tend to favour the 'residents'. First, the occupied territories have characteristics essential for frog survival -- high food abundance, moisture, leaf litter for egg deposition, and nearby females searching for a fit mate. Therefore, aggressively defending these territories has some bearing on the reproductive success of the 'residents' (refer to paragraph two).

Now that we have briefly looked at the value of occupied territories, let's explore a trade-off the males accept while they are defending their grounds. I mentioned earlier the use of an aggression call by the 'resident' once he feels threatened by an intruder. Aggression calls do not attract females. In fact, it has been reported that females actually reject this sound. So, the 'resident's' trade-off for successfully defending his ground is not being able to attract females during this period of time.

*To be continued...*

### THANK YOU!

Like all charities, we depend upon the generosity of many people to carry on our work. We would like to acknowledge and thank the following benefactors:

**Richard Woolger**, Whitby, Ontario for the donation of a solar panel for Caño Palma Biological Station.

**Reboot Canada**, Toronto, Ontario for the donation of computer equipment for Caño Palma Biological Station.

**Black and Decker**, Toronto, Ontario for the donation of power tools for Caño Palma Biological Station.

**Rotary Club of Pickering** for the donation of a slide projector and screen for the school programs in Ontario.

**Elaine Christens**, Markham, Ontario, who donated furniture which was sold at auction.

**Frances Burton and Peter Silverman**, Toronto, Ontario, who donated furniture and other memorabilia, which were sold at auction.

**Todd Southgate**, Brampton, Ontario, and **Peter Silverman**, Toronto, Ontario who donated their services to produce a promotional video for COTERC.

For their cash donations:

**David Speed**, Pickering, Ontario

**Cathy Ward**, Toronto, Ontario

**Oakland Steel**, Waterloo, Ontario

**Thomas S. Caldwell**, Toronto, Ontario

**Dr. Jim Rising**, Toronto, Ontario

**Monika Rohlmann**, Yellowknife, Northwest Territories

**Anne Cameron**, King City, Ontario

**S.F.S. Inc**, Mississauga, Ontario

and to all who have contributed to our **Partners in Preservation** project.

### RECIPES FROM THE RAINFOREST

by Anne Klein, and Karyn Rilko

Anne and I arrived to volunteer at Caño Palma Biological Station within three days of each other. Having both just completed biology degrees at the University of Colorado in Boulder and the University of British Columbia in Vancouver respectively, we each set off to see parts of the world we had learned about throughout our university careers. And so the two of us came here, to Costa Rica, to Tortuguero, to do what we could to help. We have learned so much since we've been here and have become enthusiastically involved with the butterfly project in Tortuguero village. We certainly look forward to heading in for the day to sweat like mad and get those weeds pulled and those host plants put in the ground! After a day's work, it is a stop for rations at the village *pulperia* before heading back to Caño Palma. In our short stay here, we have come to realize that even on days when the supply boat has come by, the selection is somewhat less than balanced. And as our parents' parting words of the importance of eating right are still ringing in our ears, we have become quite creative cooks - optimally using what is locally available to us here in Tortuguero. We would like to share one of our spontaneous recipes with *Raphia* readers. Please keep in mind that we did not use a recipe for this dish, and the quantities are only a guideline. Be creative, be passionate, and have fun while you cook.

You will undoubtedly put together a hearty, delicious meal.

#### CAÑO PALMA PATTIES

by Anne Klein and Karyn Rilkoff

1 tablespoon olive oil  
 1 can of sweetcorn, drained  
 1 large carrot, finely grated  
 3/4 cups cooked rice (leftovers will do)  
 1 egg  
 flour to thicken  
 salt and pepper to taste  
 toasted wholewheat bread  
 cabbage, diced

Heat the olive oil in large skillet. In a large bowl combine the corn, carrot, rice and egg. Mix well. Season with salt and pepper. Add flour to the mixture until thick enough to form soft patties. Place patties in heated oil and cover. Toast the bread. Add diced cabbage to skillet and brown. Cook until cabbage is crispy and patties are browned on both sides. Spread desired condiments to toasted bread, add patties and top with cabbage. Makes about six patties.

*Gourmet Tip: On good boat supply days, try adding minced garlic or grated cheese.*

### Are there jaguars at Cano Palma?

People visiting the station often ask this question, and until recently we held the assumption that most of the big cats had been hunted out of the immediate area. In mid October 1997 we received several new reports that highlight the problems faced by the Barro del Colorado Wildlife Refuge.

The first piece of news was wonderfully exciting. A tourist group canoeing in the Tortuguero National Park corridor near the entrance to the Rio Suerte reported sighting a jaguar. This small, swampy, backwater is just outside the Refuge limits and is occasionally visited by tour groups in canoes. It seems that this particular group got a close up view of an adult jaguar swimming in the water just behind their canoe. Talk about exciting! This week we received another piece of news about a jaguar, only this time it was not good news. It seems that

an adult female jaguar has been killed on the north side of the Cerro Tortuguero. Several independent sources have told us that a squatter living in this area killed the jaguar because it attacked his chickens. The individual attempted to sell the slain jaguar's skin, and was picked up by the park authorities. After a search of the area, 2 young cubs were found and since they were incapable of surviving on their own, they were sent to the Zoo in San Jose.

It is likely that both of these citations refer to the same jaguar as the Cerro and the backwater are very close to one another. So, are there jaguars at Cano Palma? No one knows.

The following is the text of an article published by ENN on October 30, 1997.

### BRAZIL ESTABLISHES WORLD'S LARGEST RAINFOREST RESERVE

The Government of the Brazilian State of Amazonas has created a new reserve in the Amazon, thus establishing the world's largest contiguous block of protected rainforest, the Wildlife Conservation Society, headquartered at the Bronx Zoo, announced this week.

Called the Amana Sustainable Development Reserve, it is the third of a network of protected areas in the Central Amazon Basin that together, comprise over 22,000 square miles of unbroken habitat -- an area larger than Costa Rica.

The reserve will be managed under a legal category in Brazil created in 1996 at the adjacent Mamiraua Reserve, which permits residence in protected areas and encourages local participation in their conservation. The Amana region is known for its spectacular and untouched biodiversity including endangered Amazonian manatees, black caiman, river dolphins, anacondas, jaguars, black uakari monkeys, harpy eagles, and a wealth of plants and aquatic life.

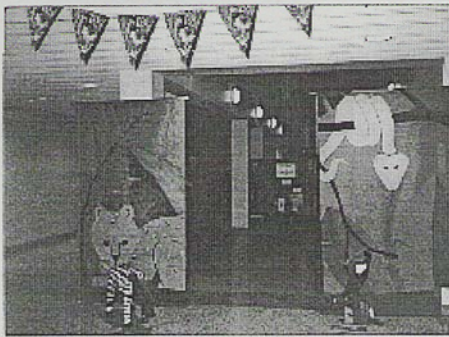
Dr. Jose Marcio Ayres, senior conservation zoologist with the Wildlife Conservation Society, designed and wrote the reserve's management scheme.

"The creation of the Amana Reserve is one of the most important measures taken in the Brazilian Amazon in the past decade. It establishes a new vision in conservation in the region, where rainforest corridors will protect not only species but entire evolutionary and ecological processes. It also preserves the unique biodiversity of the Amazon's black and white river systems. In addition, this solidifies the formation of the Central Amazonian Corridor that will protect Amazonian flooded and dryland forests," said Ayres.

For more information, contact Stephen Sautner, Wildlife Conservation Society.

#### TROPICAL TREAT FUNDRAISER A SUCCESS!

COTERC is pleased to announce the tremendous success of its first annual fundraising event, called "Tropical Treat". The gala was held on October 18, 1997 in the glass-enclosed Atrium of the Metro Toronto Zoo, and attracted guests from as far away as Burlington, Hamilton, Queensville, Guelph and Bowmanville.



*Entry to Tropical Treat*

Guests were greeted by burlap panels featuring wildlife, as well as a papier mache toucan and an armadillo. Metal pillars in the atrium were transformed into banana trees bedecked with geckos, snakes and spiders (rubber). A sloth, butterflies and bats dangled from the roof to add authenticity to the decorations. Table place settings featured poison arrow frogs and other creepy crawlies layered on leaves around a candle. As each woman

arrived, she was offered a choice of wildlife pins, donated by the Windsor Reptile World.

A tropical menu was catered by Kings Court Catering, Bowmanville Ontario, and featured such delights as spinach mandarin salad, marinated tropical vegetable salad, jerk pork, apricot-glazed chicken, rice and beans (a Caño Palma favourite!), glazed sweet potatoes, fried plantain and margarita mixed vegetables - something to please all tastes, from vegetarians to carnivores! During dinner we were treated to tropical rainforest recordings, just to keep us in the mood.

Toby Styles, Executive Director of Marketing and Communications at the Metro Toronto Zoo, was Master of Ceremonies for the evening and kept things lively. Peter Silverman (president of COTERC and CITY TV ombudsman) welcomed everyone to the event, then introduced a new video filmed for COTERC by Todd Southgate, with commentary by Peter Silverman. Everyone was very impressed and warmly applauded this new promotional vehicle for COTERC. A very special thank you goes to Todd Southgate, who travelled to Caño



*Discussing a bid at the Silent Auction*

Palma last June at his own expense to shoot the video, and then spent hours and hours in the editing suite so that we could feature it at the Tropical Treat.

Our silent auction featured a wide range of exciting items including a Costa Rica package (a stay at Caño Palma

Biological Station, a night at two separate hotels and a catamaran cruise), a hand-made afghan, a porcelain doll, snake stamps, therapeutic massage, various books, stained glass, a Spode china plate, a hand-knitted



*Jack Layton - auctioneer extra-ordinaire!*

biologist doll, a flight in a Cessna 152, butterfly photos taken at Caño Palma, autographed ballet slippers, aboriginal masks, snake earrings, bird feeder, Timex watches, CD's autographed by our honorary patron Sir Charles McKerras, canoe lessons -- and much more!

We also held a live auction featuring Jack Layton, a well-known local political who did an outstanding job in getting just that little bit higher bid from the audience, who bid energetically for the eleven items offered including: a behind-the-scenes tour of the Metro Toronto Zoo, a hand-painted ostrich egg; a 15th century reproduction of a Spanish sword; an original painting by Jabari one of Metro Zoo's lowland gorillas; a paddle party in canoes for 6 persons; a week at a bed and breakfast in Ocean Grove, New Jersey; an original painting of the Indian elephant; one week of riding camp; a catered barbecue featuring chicken and steak; a lithograph of "The Tempest" and a unique ceramic vase featuring a crocodile.

As if this wasn't enough excitement, we also held a raffle in which the purchaser could place the ticket in a choice of jar to have a chance to win various items including a Maple Leafs hockey package (tickets, autographed puck, hat), Blue Jays baseball package, Raptors basketball package, Argos football package, and other good stuff.

The evening ended with plenty of dance music, courtesy of Lonesome Charlie, DJ.

The event raised just over \$6,000 -- our goal had been \$5,000 so we were very pleased for our first effort. For those of you who missed it, be sure to keep your eyes peeled for the second "Tropical Treat". It will be bigger and better.

Organising an event of this size takes a lot of hard work and planning on the part of many people. Malcolm

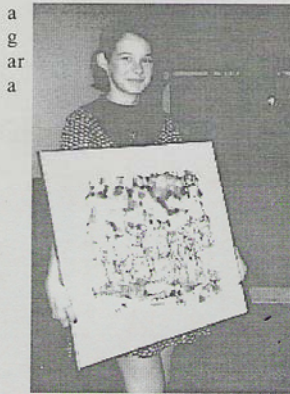


*Malcolm Enright & Fran Mason*

Enright did an outstanding job as chair, along with his trusty committee Fran Mason, Tom Mason, Marilyn Cole and Katrina Chan.

We also would like to thank the following people for their assistance:

Cal White, General Manager, Metro Toronto Zoo, for the use of the Atrium,  
 Toby Styles  
 Peter Silverman  
 Jack Layton  
 Lonesome Charlie Ray, DJ, Toronto  
 Laurie Shepherd, CobbleStone Studios, who produced the catalogue for the event  
 Gwen Smith, bartender  
 Terry Male, bartender  
 Debbie 'Vanna' Mason  
 Daniel Mason  
 Heidi Kaufman  
 Ginette Stevens  
 Southern Ontario chapter of American Association of Zoo Keepers  
 Education Department of Metro Toronto Zoo



Auctioneer's Assistant, Debbie Mason showing one of the lots on offer.

and all those who generously donated tickets to the auctions.

Spider monkey (4)  
Bats (4)  
Paca  
Pecaries  
River otters (2)

#### Reptiles and Amphibians

Brown white vine snake (*Oxybelis*)  
*Chelonia mydas* (baby)  
Iguana iguana  
Smoky jungle frog (*Pentadactylus*)  
Iguana iguana  
Frog (*Hylidae*)  
Boa constrictor  
*Basiliscus plumifrons*  
Iguana iguana  
Frogs (5)  
Jesus Christ lizards  
Caiman (2)  
Smoky jungle frog  
Gaudy leaf frog  
Fer de Lance (in National Park)  
Crocodile

#### Observation highlights for August - October

#### Birds

*Buteo platypterus* (Broad winged Hawk) (migrating south from Cano Palma over corridor of park)  
*Ara ambigua* (Great Green Macaw)  
Great Potoo  
Chestnut mandibled toucan  
White-collared Manakin  
Red-capped Manakin  
Buffthroat Saltator  
Prothonotary Warbler  
Long-tailed Hermit  
Blue Chested Hummingbird  
Little Hermit  
Bronzy Hermit  
Crowned Woodnymph  
Rufous-tailed Hummingbird

#### Mammals

Kinkajou  
Tapir tracks (on trail)  
Opossum  
Dead Margay on trail  
Long-nosed bats (12)  
Howler monkeys  
White-faced Capuchin

#### Raphia Staff

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	Marilyn Cole	Jim Stanford

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