

**CONSERVATION OF CRITICALLY
ENDANGERED AMPHIBIANS:
Atelopus farci AND
Bolitoglossa capitana FROM
COLOMBIA**



Conservation of critically endangered amphibians: *Atelopus farci* and *Bolitoglossa capitana* from Colombia.



**Final report submitted to the Rufford Small Grant committee
By**

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SUMMARY

During the last year a team of young conservationists of Fundación Ecodiversidad Colombia developed the project "Conservation of critically endangered amphibians: *Atelopus farci* and *Bolitoglossa capitana* from Colombia", which had as aim to investigate the state of conservation of some species of threatened amphibians in the Departamento de Cundinamarca of Colombia. This project obtained as results the discovery of a new specie of poison frog for Colombia, the discovery of another possible new species of frog but later studies are required for confirm the identity of this last amphibian, and the discovery of a probable new population of the Pandi mushroom-tongue salamander (*Bolitoglossa pandi*) an endangered species of the Cloud Andean forests of the Departamento de Cundinamarca. Nevertheless, all our effort weren't successes, later of 8 months of search of the Salamander of Albán (*Bolitoglossa capitana*) and the Harlequin frog of Albán (*Atelopus farci*). These species were not registered in none of those samplings. These discourage results demonstrate the worry existing to world level for the amphibian decline. This report shows the results obtained in a year of searches for some places in the Departamento de Cundinamarca, Colombia

INTRODUCTION

Several amphibians' species around the world are threatened for many factors which are not clear, but maybe the next three factors are the principal causes of this biodiversity crisis: the habitats destruction, the climate changes and the appearance of a pathogenic fungus had decreased the populations of amphibians in worldwide. In Colombia 208 species are now threatened of extinction; several of these species, their current distributions and their ecological requirements are poorly known (Rueda, *et al.*, 2004; Carey & Alexander, 2003; Collins & Storer, 2003; Lips, *et al.*, 2005 and Blaustein, *et al.*, 1994).

The Salamander of Alban (*Bolitoglossa capitana*) and the Harlequin frog of Alban (*Atelopus farci*) are critically endangered species, endemic to forest of the Bogotá and the Negro river (Colombia). Although extremely poorly known, their current distributions are likely to be highly restricted and their remaining forest habitat is under intense anthropogenic pressure, in order to develop and urgently needed and effective conservation strategy for these two species and others that are also threatened.

The principal purpose with this project was to locate news population of these threatened amphibians which have more of 15 years without documented record, for obtaining basic and crucial information about the ecology of this species; thereby we can contribute to know their current distribution and to develop environmental campaigns with the local communities for awareness about the importance of to protect and to conserve the fauna and flora of this region and show them the importance and the many services that provide the amphibians to ecosystems and the humanity. Also anthropogenic threats to the amphibians and their habitats were determined through observation in the field and interviews with local people.

METHODS

1. Study areas

This project was performed in the Andean mountain of the Departamento de Cundinamarca, in the western slope of the Cordillera Oriental of Colombia (Figure 1), mainly in the basins of the rivers Negro and Bogotá, but other areas of Cundinamarca were also explored in search of threatened amphibians.

During eight months approximately were performed samplings in different municipalities of Departamento de Cundinamarca (Figure 2). Most of the samplings were performed in fragments of forests with native vegetation, but other Places as cultivated lands, areas for the raising cattle and agro-ecosystems were also surveyed. Next we show the municipalities and places that were explored in this project:



Figure 1. Geographical location of Departamento de Cundinamarca, Colombia.

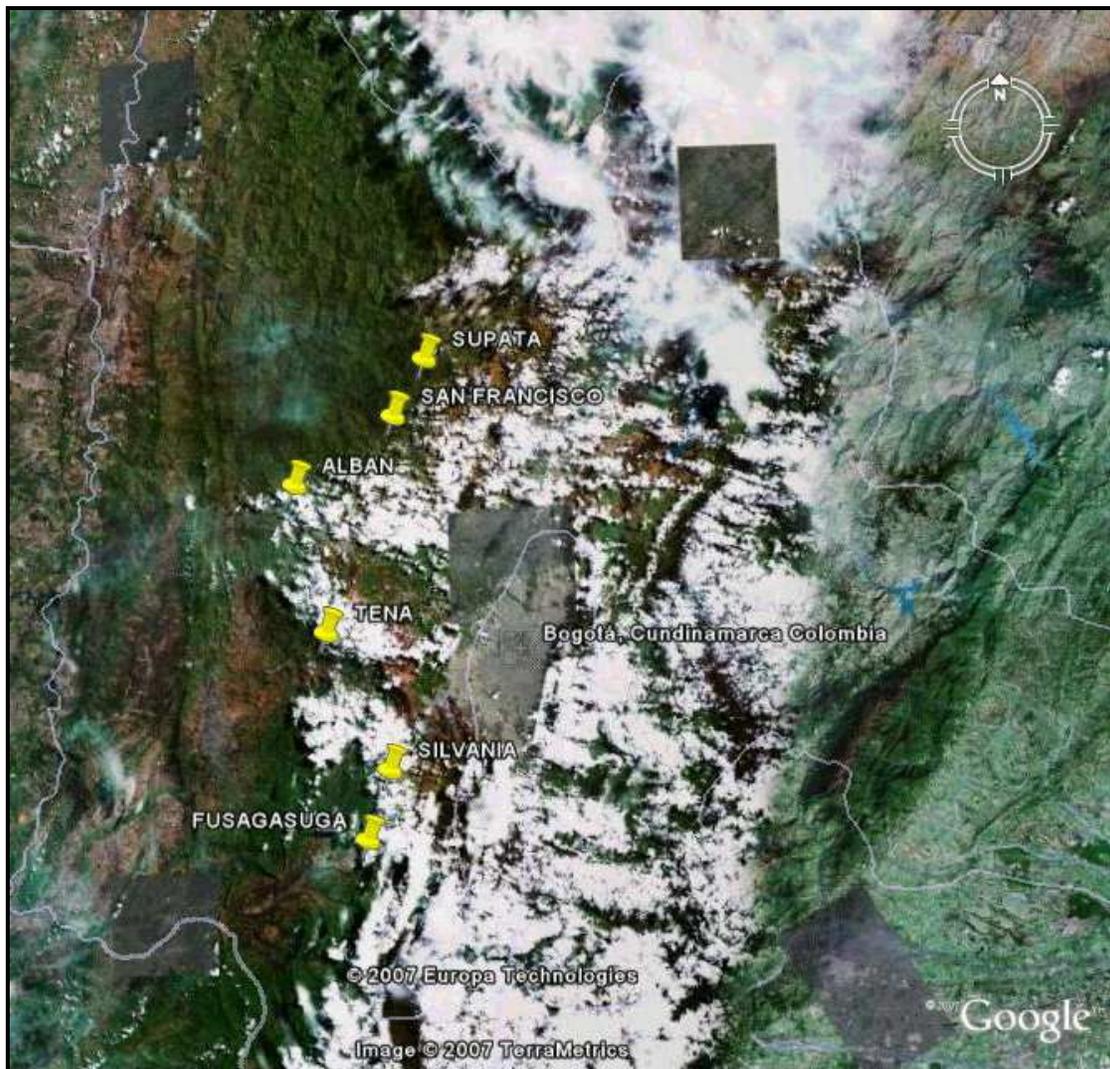


Figure 2. Municipalities explored in this project

Municipio de Albán: in this municipality the samplings mainly were in the type locality of the Salamander of Albán (*Bolitoglossa capitana*) and the Harlequin frog of Albán (*Atelopus farci*), the fragments of forest around of Granja Infantil El Gran Ciudadano Padre Luna, vereda Tres Marias (Figure 3). (GPS position 04° 53' 39.5" N; 74° 25' 17.8" W, 2085 to 2250 meters a.s.l)

Municipio de Fusagasugá: the samplings were performed in the area known as La Aguadita and San Rafael (GPS position 04°26'21.3" N; 74°18'38.6"W, 2200 to 2600 meters a.s.l) (Figure 4).

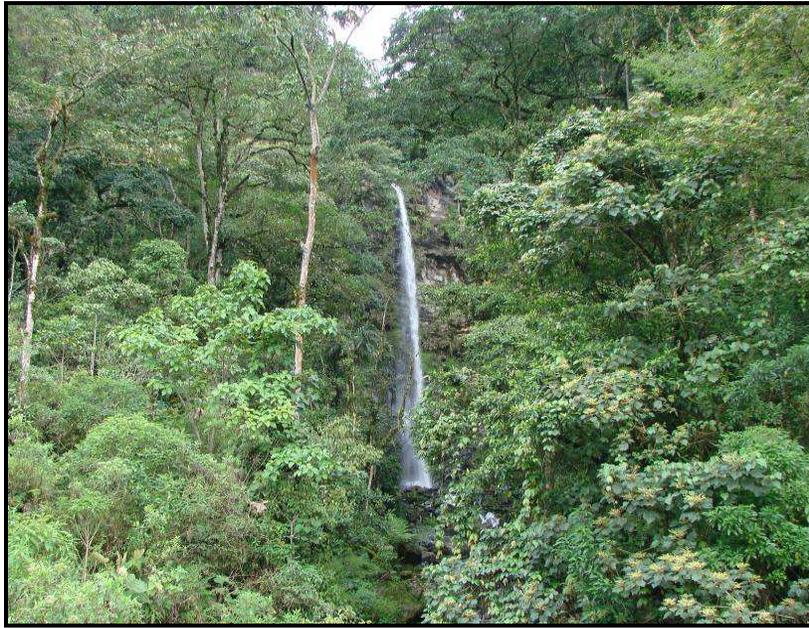


Figure 3. Forest and cascade in where was find *A. farci* some years ago, Albán
(Photograph by G. Chaves Portilla)



Figure 4. Relicts of forest in the San Rafael area, Fusagasugá
(Photograph by G. Chaves Portilla)

Municipio de Supatá: was the zone more important in this Project. This municipally gave the best results due to was in this place where we were performed the most important discoveries of this project. (GPS position 05° 02' 01.9" N; 74° 15' 37.4" W; 05° 02' 02.9" N 74° 14' 04.4" W; 05° 03' 27.0" N; 74° 15' 35.7" W, 1620 to 2350 a.s.l) (Figure 6 and 7).



Figure 5. General view of the sampling area in the Municipio de San Francisco
(Photograph by G. Chaves Portilla)

Municipio de San Francisco: in this municipality the explorations were performed in boundaries of Municipio de Supatá where exist fragments of forest that could offer some value of conservation for these threatened amphibians. (GPS position $05^{\circ} 01' 24.1''\text{N}$; $74^{\circ} 16' 38.2'' \text{W}$, 1850 to 2200 a.s.l) (Figure 5).



Figure 6. Stream in Vereda Las Lajas, Supatá
(Photograph by G. Chaves Portilla)



Figure 7. Fragment of Cloud Andean forest in Vereda San Marcos, Supatá
(Photograph by G. Chaves Portilla)

Municipio de Tena: the explorations were performed in the Laguna de Pedropalo's forest (GPS position 04° 41' 04.5" N; 74° 23' 24.1" W, 1940 to 2120 a.s.l) and Cascada del Tambo area (GPS position 04° 39' 47.7" N; 74° 22' 37.9"W, 1540 a.s.l) (Figure 8 and 9).

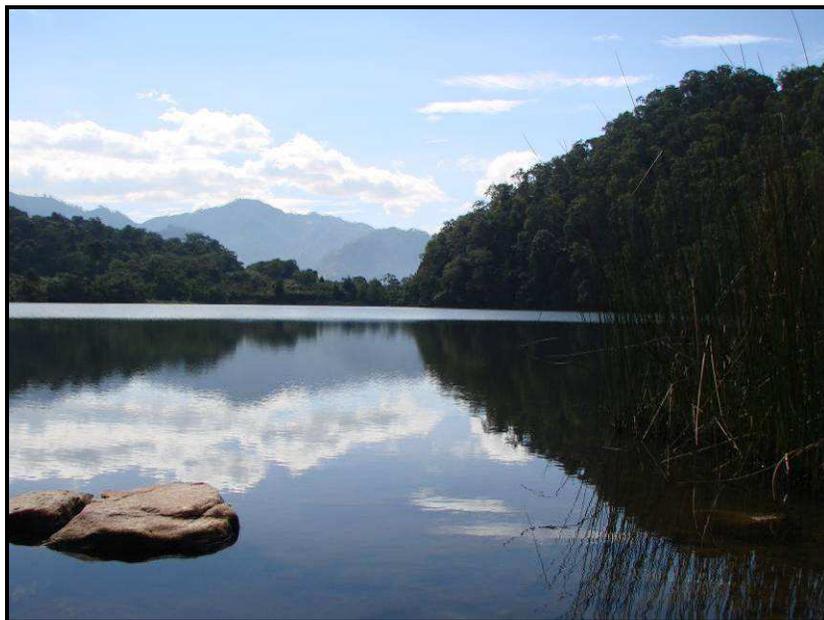


Figure 8. Laguna de Pedropalo, Tena
(Photograph by G. Chaves Portilla)

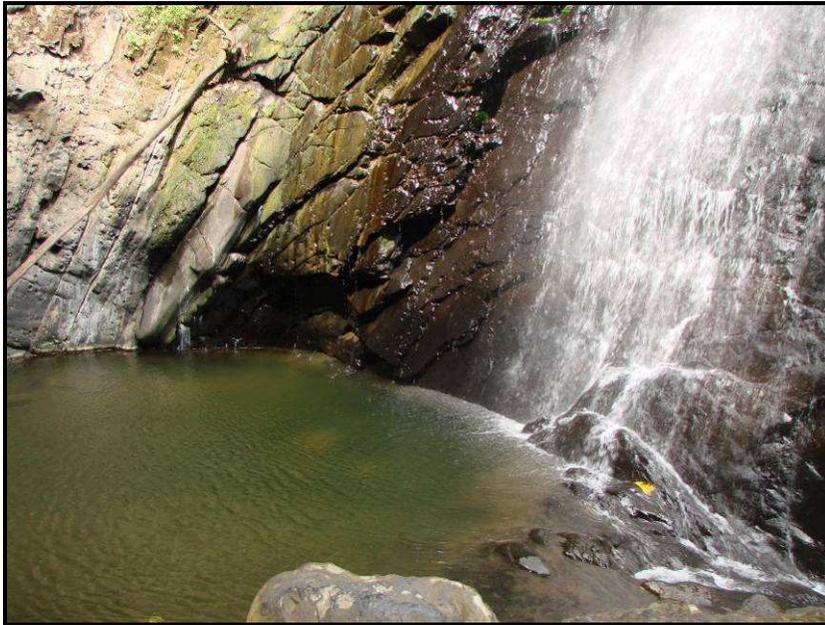


Figure 9. Cascada El Tambo, Tena
(Photograph by G. Chaves Portilla)

2. Sampling method

We use in all the sampling areas the technique of Visual Encounter Survey (VES) which is one of the most commonly used survey techniques for frogs and salamanders and can be used to measure species composition, relative abundance, habitat association, and activity. This technique is conducted by observers walking through a designated area for a prescribed time, visually searching, for animals. The number of animals encountered are noted along with time elapsed during the survey (Heyer, *et al.* 2001 and Lips *et al.* 2001).

Visual encounter surveys are effective in easily identifiable habitats, such as riparian zones or ponds or in uniform habitats with good visibility. Species that are highly clumped are also good targets for VES, for example, pond breeding amphibians. In this case, the survey is restricted to the particular Places (ponds) of interest. VES is also useful in surveying species that are difficult to catch in traps or are rare. It is an inappropriate technique to use in searching for fossorial or canopy dwelling species. VES can be applied in monitoring and surveying designs. Visual encounter surveys can determine species richness, provide information for compilation of a species list, and provide data used to estimate proportion of area surveyed that is occupied by target species. Data collected field information on the presence of a species but does not establish absence, nor does it give reliable estimates of abundance. VES can be used along transects, streams, ponds, in quadrants or larger areas. There are three standard sampling designs for VES, randomized walk, transects, or a quadrant design (Heyer *et al.* 2001). We use the randomized walks with limit of time as standard sampling for our explorations (Figure 10).

To determine the relative abundances we use the categories proposed by Rueda *et al.* in Angulo *et al.*, 2006.

**Category of abundance
(Number of individuals for 100 hours of observation)**

Ordinal scale

< 0.1	Rare
0.1-2.0	Uncommon
2.1-10	Frequent
10.1-40	Common
>40	Abundant

Where the encounter rate = Total number of individuals registered, divided by duration of the observation's period. (Table 1).

Species	Number of individuals per each observer (3 observers)			Number of individuals / 10 hours	Abundance status
	1 (2 Hours)	2 (3 Hours)	3 (3 Hours)		
				Encounter rate X 10	
<i>B. pandi</i>	1	0	0	1.25	Uncommon
<i>Ranitomeya</i> sp.	8	4	6	22.50	Common

Table 1. Example of relative abundance categories calculation in function to the encounter rate of multiple observers. (Modified of Angulo *et al.*, 2006).

3. Register of field data

To each found amphibian, we registered the following data:

- a. Date and hour of the register.
- b. Species (if we could determine).
- c. Temperature and relative humidity to the beginning and the final of each sampling.
- d. Morphological measures (if the specimen was captured).
- e. Microhabitat used.
- f. Outstanding aspects on life history, behavior, etc. that we could register in the moment of the observations.
- g. Photographic records with professional camera (if is possible).

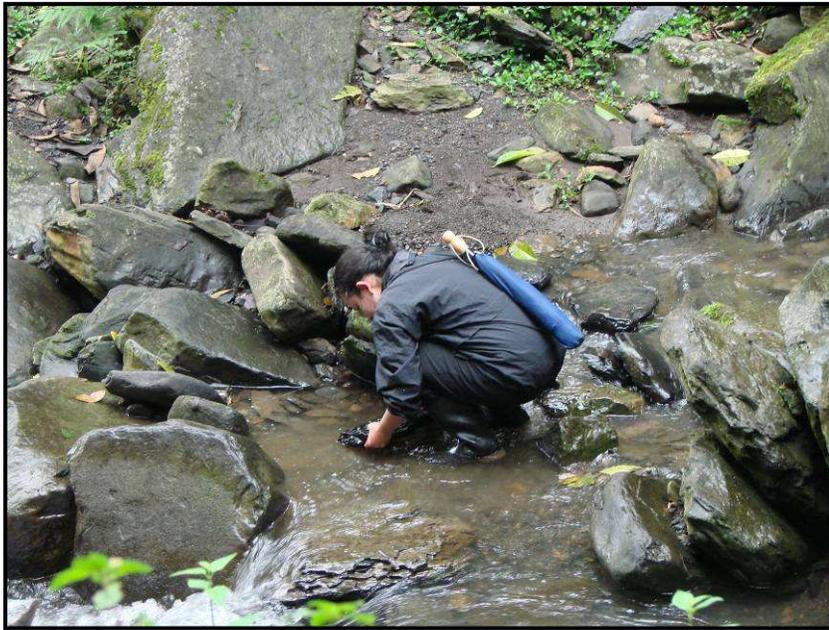


Figure 10. Stream sampling at Municipio Alban
(Photograph by G. Chaves Portilla)

4. Biosecurity.

Keeping in mind that one of the possible causes of the amphibian declines is a pathogen fungus (see Lips, *et al.* 2005; Pound, *et al.* 2006 and Gardner, 2001) we implement a biosecurity protocol for the fieldwork proposed by Speare *et al.* in 2004 (Table 2).

All the captured specimens were deposited in plastic bags (use one plastic bag per specimen) for subsequently to register the animal's data. When concluding, the bags were discarded.

Purpose	Disinfectant	Concentration	Time
Disinfecting Fieldwork equipment and containers	Sodium hypochlorite (Bleach)	4%	15 min.
Disinfecting footwear	Sodium hypochlorite (Bleach)	4%	15 min.
Disinfecting cloth	Hot wash	60°C or greater	5 min.

Table 2. Disinfection strategies suitable for killing *Batrachochytrium dendrobatidis* in field studies. Where concentrations and time are given, these are minimum shown to be effective. (Modified of Speare *et al.*, 2004).

5. Identification of Anthropogenic threats and Environmental education

The identification of anthropogenic threats was determined through observations in field and conversations with inhabitants of the search zones.

The environmental education work was performed mainly in the areas where the important results were obtained, but also in the areas where satisfactory results were not obtained; we talked with the local people of these areas about the amphibian decline, your causes and the urgent need of protect and conserve the flora and fauna of these places. On the other hand, we worked with the children creating a group forests' friends which they learned the importance of protecting the forest and as the forest give water, oxygen and food for everybody. We made long walks into the forest with some children, making that the kids saw, felt and tested the environment.

RESULTS

Next will be shown the results obtained in each one of the study areas:

Municipio de Albán: such as we said previously, this municipality is the type locality of the two focal species, for this reason this zone had of great importance for this project. In total 96 hours of capture effort were invested in this zone without any register of these two species of amphibians. A total of 192 hours of capture effort were invested in this place. At these hours of sampling only registered three types of amphibians, these are the Palm Rocket Frog (*Rheobates palmatus*) (Figure 11), The Rain Frog (*Eleutherodactylus* sp.) (Figure 12) and The Padre Luna's treefrog (*Dendropsophus padreluna*) (Figure 13). Similarly for this area is reported the presence of another species of threatened endemic amphibian, the Inger's Big- Headed Frog (*Eleutherodactylus ingeri*) (VU), but was not found in these samplings

For our team and other previous ones us, the fruitless of the searches performed in this area, makes thinking in a possible local extinction of these two species of amphibians. (Rueda-Almonacid & Rueda-Martinez, 2004)

Is notable the serious destruction of the Andean forests of this region for the adaptation of lands for the agriculture and the raising cattle; is possible to observe small secondary forest fragments, which have a little connectivity among these (Figure 14). Another confirmation of the alteration in the habitat is evident in the cascade where previously the harlequin frog of Albán (*Atelopus farci*) was observed, today this cascade and the river that the form are contaminated with waste and the lands that surround them are slipping due to the deforestation of the banks of the river (Figure 15).



Figure 11. *Rheobates palmatus*, a female, endemic species from Colombia Municipio de Supatá
(Photograph by G. Chaves Portilla)



Figure 12. *Eleutherodactylus* sp. Municipio de Albán
(Photograph by G. Chaves Portilla)



Figure 13. *Dendropsophus padreluna*, endemic species from Colombia.
Municipio de Albán
(Photograph by G. Chaves Portilla)



Figure 14. Area adapted as grassland for the raising cattle. To the bottom, fragments of Andean forest. Municipio de Albán
(Photograph by G. Chaves Portilla)



Figure 15. Slip area produced for the deforestation in the river Dulce.
Municipio de Albán
(Photograph by G. Chaves Portilla)

Municipio de Fusagasugá: although the sampling area has well conserved zones of Andean forest, the efforts to find threatened amphibians were disheartening. besides the two focal amphibians for this study, the area is important to present three species more than amphibians threatened, The Ruiz's Rocket Frog (*Hyloxalus ruizi*) (CR) , Bogotá Stubfoot Toad (*Atelopus subornatus*) (EN) and Renjifo's rainfrog (*Eleutherodactylus renjiformis*) (VU). In total 60 hours of capture effort were invested in these places but none of these species was found.

The anthropogenic threats that are more remarkable in this area are the destruction of the forest for the raising cattle and the accumulation of waste in the rivers and streams (Figure 16 and 17).

Municipio de Supatá: 76 hours of capture effort were invested in this municipally, in which we achieved the discovery of the Golden Poison Frog of Supatá (*Ranitomeya* genus), a new species of frog (Figure 18 and 19). Other achievement was the discovery a possible new population of the Pandi mushroom-tongue salamander (*Bolitoglossa* cf. *pandi*) (Figure 20) and another possible new species of frog of the *Hyloxalus* genus, (Figure 21) although several taxonomic studies are necessary for confirming the identity of these last two amphibians.

A research bases was established in this area for four months to register some ecological data of these species. Between the months of September and December of 2007 we perform a total of twelve VES (Visual Encounter Survey) additional to the 76 hours of capture effort invested in explorations; three per month, with an effort of capture of 4, 3 and 3 hours/man respectively for a total of capture effort per month of 10 hours/man.



Figure 16. Lands that previously were covered with Andean forests, now appropriate for the raising cattle. San Rafael, Fusagasugá
(Photograph by G. Chaves Portilla)



Figure 17. Border of stream where is observed the accumulation of garbage and construction wastes. Sector of La Aguadita. Fusagasugá
(Photograph by G. Chaves Portilla)

The data obtained in September:

Date: 20 September / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°01' 59.6" N; 74°15' 48.1" W **Height:** 2090 meters a.s.l
Climate conditions: Sunny **Initial temperature:** 19.4 °C **Final temperature:** 21.2°C
Initial relative humidity: 81% **Final relative humidity:** 65%
Initial hour: 10:08 **Final hour:** 14:10 **Invested hours:** 4 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Ranitomeya</i> sp.	F	10:30	Leaf litter
2.	<i>Ranitomeya</i> sp.	/	10:36	Leaf litter
3.	<i>Bolitoglossa cf pandi</i>	F	10:47	Leaf litter
4	<i>Ranitomeya</i> sp.	/	11:14	Leaf litter
5	<i>Ranitomeya</i> sp.	/	12:11	Leaf litter
6	<i>Ranitomeya</i> sp.	F	12:18	Fallen trunk
7	<i>Ranitomeya</i> sp.	/	12:21	Leaf litter
8	<i>Ranitomeya</i> sp.	/	12:32	Leaf litter
9	<i>Ranitomeya</i> sp.	J	12:47	Leaf litter
10	<i>Hyloxalus</i> sp.	/	12:59	Leaf litter
11	<i>Ranitomeya</i> sp.	/	13:08	Leaf litter
12	<i>Ranitomeya</i> sp.	/	13:22	Hole trunk
13	<i>Ranitomeya</i> sp.	/	13:34	Leaf litter
14	<i>Ranitomeya</i> sp.	/	13:35	Leaf litter
15	<i>Hyloxalus</i> sp.	/	13:43	Leaf litter
16	<i>Bolitoglossa cf pandi</i>	IF	13:48	Leaf litter
17	<i>Bolitoglossa cf pandi</i>	F	14:08	Leaf litter

F: Female IF: Immature female.

Date: 22 September / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°02' 05.4" N; 74°15' 48.9" W **Height:** 1858 meters a.s.l
Climate conditions: Sunny **Initial temperature:** 18.1°C **Final temperature:** 19.3°C
Initial Relative Humidity: 82% **Final Relative Humidity:** 81%
Initial Hour: 10:00 **Final Hour:** 13:11 **Invested hour:** 3 hours/man

#	Species	Sex	SVL (mm)	TL (mm)	W (g)	Hour	Microhabitat
1	<i>Bolitoglossa cf pandi</i>	J	24.3	21.1	0.4	10:04	Leaf litter
2.	<i>Bolitoglossa cf pandi</i>	M	39.6	33.3	1.4	10:12	Leaf litter
3.	<i>Bolitoglossa cf pandi</i>	J	17.8	12.2	/	10:46	Leaf litter
4	<i>Bolitoglossa cf pandi</i>	J	13.6	0.90	/	11:05	Leaf litter
5	<i>Bolitoglossa cf pandi</i>	M	37.7	32.3	1.1	11:22	Fallen bromeliad
6	<i>Bolitoglossa cf pandi</i>	F	43.3	NT	1.7	11:37	Leaf litter
7	<i>Bolitoglossa cf pandi</i>	F	43.1	34.7	1.8	12:01	Leaf litter
8	<i>Bolitoglossa cf pandi</i>	J	26.5	0.63	0.4	12:43	Leaf litter
9	<i>Rheobates palmatus</i>	/	/	/	/	12:44	Stream

J: Juvenile M: Male

Date: 23 September / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°01' 59.2" N; 74°15' 47.7" W **Height:** 2110 meters a.s.l
Climate conditions: Cloudy **Initial temperature:** 16.6°C **Final temperature:** 17.7°C
Initial Relative Humidity: 92% **Final Relative Humidity:** 85%
Initial Hour: 10:00 **Final Hour:** 13:04 **Invested hour:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Bolitoglossa cf pandi</i>	F	11:21	Leaf litter
2.	<i>Bolitoglossa cf pandi</i>	M	11:28	Leaf litter
3.	<i>Bolitoglossa cf pandi</i>	IF	11:32	Leaf litter
4	<i>Hyloxalus</i> sp.	/	11:37	Leaf litter
5	<i>Ranitomeya</i> sp.	/	11:44	Fallen trunk
6	<i>Bolitoglossa cf pandi</i>	IF	11:51	Leaf litter
7	<i>Ranitomeya</i> sp.	/	12:06	Leaf litter
8	<i>Bolitoglossa cf pandi</i>	J	12:10	Leaf litter
9	<i>Rheobates palmatus</i>	M	12:17	Stream
10	<i>Ranitomeya</i> sp.	/	12:20	Leaf litter
11	<i>Ranitomeya</i> sp.	M	12:21	Fallen bromeliad
12	<i>Ranitomeya</i> sp.	J	12:29	Leaf litter
13	<i>Ranitomeya</i> sp.	J	12:39	Leaf litter

Species	Number of individuals			Number of individuals / 10 hours Encounter rate X 10	Abundance Status
	1 day (4 Hours)	2 day (3 Hours)	3 day (3 Hours)		
<i>Bolitoglossa cf pandi</i>	3	8	5	16	Common
<i>Ranitomeya</i> sp.	12	0	6	18	Common
<i>Hyloxalus</i> sp.	2	0	1	3	Frequent
<i>Eleutherodactylus</i> sp.	0	0	0	0	Rare
<i>Dendropsophus padreluna</i>	0	0	0	0	Rare
<i>Rheobates palmatus</i>	0	1	1	2	Uncommon

Table 3. Abundance status of the amphibians species found in September at Municipio de Supatá.

In total we registered thirty nine amphibians in September's sampling, which sixteen were salamanders (41.0%) (Common status), eighteen were golden poison frog of Supatá (46.1%) (Common status), three were frogs of *Hyloxalus* genus (7.6%) (Frequent status) and two were Palm rocket frogs (5.1%) (Uncommon species). We don't register individuals of Padre Luna's treefrog neither individuals of Rain frogs (these two species were rare in this sampling). Also in September sampling was possible

register two broods of salamander's eggs in the leaf litter, with a total of fifteen eggs for the first group and sixteen for the second group. These broods were revised every month to observe the development of the eggs and to register the quantity of eggs that survived every month. Furthermore, we observed a male of the golden poison frog of Supatá carrying a tadpole on his back; this report is important to know the reproduction time of the new species.

The data obtained in October:

Date: 20 October / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°02' 00.8" N; 74°15' 46.0" W **Height:** 2075 meters a.s.l
Climate conditions: Cloudy **Initial temperature:** 16.6 °C **Final temperature:** 16.4°C
Initial relative humidity: 82% **Final relative humidity:** 92%
Initial hour: 10:00 **Final hour:** 14:04 **Invested hours:** 4 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Bolitoglossa cf pandi</i>	F	10:06	Leaf litter
2.	<i>Ranitomeya</i> sp.	/	10:52	Leaf litter
3.	<i>Ranitomeya</i> sp.	/	11:16	Leaf litter
4	<i>Ranitomeya</i> sp.	/	11:20	Leaf litter
5	<i>Ranitomeya</i> sp.	F	11:44	Leaf litter
6	<i>Ranitomeya</i> sp.	/	11:55	Leaf litter
7	<i>Ranitomeya</i> sp.	M	12:30	Leaf litter
8	<i>Ranitomeya</i> sp.	/	12:45	Leaf litter
9	<i>Ranitomeya</i> sp.	/	12:47	Leaf litter
10	<i>Ranitomeya</i> sp.	/	12:51	Leaf litter
11	<i>Bolitoglossa cf pandi</i>	J	13:19	Fallen bromeliad
12	<i>Ranitomeya</i> sp.	J	13:30	Leaf litter
13	<i>Ranitomeya</i> sp.	F	13;32	Leaf litter

Date: 21 October / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°01' 58.0" N; 74°15' 44.6" W **Height:** 2078 meters a.s.l
Climate conditions: Cloudy with fog **Initial temperature:** 15.8°C **Final temperature:** 15.7°C **Initial Relative Humidity:** 95% **Final Relative Humidity:** 99%
Initial Hour: 10:00 **Final Hour:** 13:04 **Invested hour:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Ranitomeya</i> sp.	/	10:04	Leaf litter
2.	<i>Bolitoglossa cf pandi</i>	F	10:12	Leaf litter
3.	<i>Ranitomeya</i> sp.	/	11:54	Leaf litter
4	<i>Bolitoglossa cf pandi</i>	PF	12:04	Leaf litter
5	<i>Bolitoglossa cf pandi</i>	F	12:12	Leaf litter
6	<i>Bolitoglossa cf pandi</i>	J	12:43	Leaf litter
7	<i>Ranitomeya</i> sp.	/	12:47	Leaf litter
8	<i>Ranitomeya</i> sp.	J	12:51	Leaf litter

PF: Pregnant female

Date: 22 October / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°02' 06.9" N; 74°15' 47.2" W **Height:** 2077 meters a.s.l
Climate conditions: Sunny **Initial temperature:** 14.9°C **Final temperature:** 15.4°C
Initial Relative Humidity: 90% **Final Relative Humidity:** 94%
Initial Hour: 10:00 **Final Hour:** 13:07 **Invested hour:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Bolitoglossa cf pandi</i>	F	10:25	Leaf litter
2.	<i>Bolitoglossa cf pandi</i>	F	10:32	Leaf litter
3.	<i>Bolitoglossa cf pandi</i>	F	10:43	Leaf litter
4	<i>Bolitoglossa cf pandi</i>	J	10:52	Leaf litter
5	<i>Bolitoglossa cf pandi</i>	J	11:32	Leaf litter
6	<i>Ranitomeya</i> sp.	/	11:46	Leaf litter
7	<i>Ranitomeya</i> sp.	M	11:48	Leaf litter
8	<i>Ranitomeya</i> sp.	/	12:15	Leaf litter
9	<i>Bolitoglossa cf pandi</i>	J	12:51	Leaf litter

Species	Number of individuals			Number of individuals / 10 hours	Abundance Status
	1 day (4 Hours)	2 day (3 Hours)	3 day (3 Hours)		
<i>Bolitoglossa cf pandi</i>	2	4	6	12	Common
<i>Ranitomeya</i> sp.	11	4	3	18	Common
<i>Hyloxalus</i> sp.	0	0	0	0	Rare
<i>Eleutherodactylus</i> sp.	0	0	0	0	Rare
<i>Dendropsophus padreluna</i>	0	0	0	0	Rare
<i>Rheobates palmatus</i>	0	0	0	0	Rare

Table 4. Abundance status of the amphibians species found in October at Municipio de Supatá.

In this month we registered in total thirty amphibians of those twelve were salamanders (40%) (Common status) and eighteen were golden poison frogs of Supatá (60%) (Common status); the other species was not registered in this month placing them as rare species in the status of abundance.

Also we revised the salamander's broods, counting fifteen eggs in the first group and sixteen eggs in the second group. In October wasn't possible observed development sign in these eggs neither males of golden poison frog were observed carrying tadpoles.

The data obtained in November:

Date: 23 November / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°01' 57.9" N; 74°15' 45.1" W **Height:** 2082 meters a.s.l
Climate conditions: Cloudy-sunny **Initial temperature:** 16.0 °C **Final temperature:** 16.8°C
Initial relative humidity: 91% **Final relative humidity:** 88 %
Initial hour: 10:02 **Final hour:** 14:07 **Invested hours:** 4 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Bolitoglossa cf pandi</i>	J	10:42	Leaf litter
2	<i>Bolitoglossa cf pandi</i>	PF	10:55	Leaf litter
3	<i>Ranitomeya sp.</i>	/	11:07	Fallen bromeliad
4	<i>Bolitoglossa cf pandi</i>	J	12:13	Leaf litter
5	<i>Ranitomeya sp.</i>	/	12:28	Leaf litter
6	<i>Bolitoglossa cf pandi</i>	J	12:44	Leaf litter
7	<i>Bolitoglossa cf pandi</i>	M	12:50	Leaf litter
8	<i>Bolitoglossa cf pandi</i>	F	13:06	Leaf litter
9	<i>Dendropsophus padreluna</i>	/	13:24	Leaf litter

Date: 24 November / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°02' 02.8" N; 74°15' 33.8" W **Height:** 2178 meters a.s.l
Climate conditions: Cloudy-sunny **Initial temperature:** 17.8 °C **Final temperature:** 17.5°C
Initial relative humidity: 85% **Final relative humidity:** 87%
Initial hour: 10:02 **Final hour:** 13:05 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Ranitomeya sp.</i>	J	10:03	Leaf litter
2.	<i>Ranitomeya sp.</i>	M	10:40	Leaf litter
3.	<i>Ranitomeya sp.</i>	/	10:42	Leaf litter
4	<i>Ranitomeya sp.</i>	F	10:47	Leaf litter
5	<i>Ranitomeya sp.</i>	/	10:51	Leaf litter
6	<i>Bolitoglossa cf pandi</i>	F	10:53	Leaf litter
7	<i>Bolitoglossa cf pandi</i>	J	10:59	Leaf litter
8	<i>Bolitoglossa cf pandi</i>	F	11:21	Leaf litter
9	<i>Hyloxalus sp.</i>	/	11:25	Leaf litter
10	<i>Bolitoglossa cf pandi</i>	J	11:52	Leaf litter
11	<i>Ranitomeya sp.</i>	M	12:24	Leaf litter
12	<i>Ranitomeya sp.</i>	M	12:49	Leaf litter

Date: 25 November / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°01' 36.7" N; 74°14' 58.9" W **Height:** 2064 meters a.s.l
Climate conditions: Cloudy-sunny **Initial temperature:** 17.8 °C **Final temperature:**
17.5°C **Initial relative humidity:** 82 % **Final relative humidity:** 73 %
Initial hour: 10:02 **Final hour:** 13:05 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Bolitoglossa cf pandi</i>	F	10:06	Leaf litter
2.	<i>Ranitomeya sp.</i>	J	10:55	Leaf litter
3.	<i>Bolitoglossa cf pandi</i>	J	10:57	Leaf litter
4	<i>Ranitomeya sp.</i>	/	11:56	Leaf litter
5	<i>Ranitomeya sp.</i>	J	12:00	Leaf litter
6	<i>Ranitomeya sp.</i>	/	12:02	Leaf litter
7	<i>Eleutherodactylus sp.</i>	/	12:05	Leaf litter
8	<i>Ranitomeya sp.</i>	M	12:28	Leaf litter

Species	Number of individuals			Number of individuals / 10 hours	Abundance Status
	1 day (4 Hours)	2 day (3 Hours)	3 day (3 Hours)		
<i>Bolitoglossa cf pandi</i>	6	4	2	12	Common
<i>Ranitomeya sp.</i>	2	7	5	14	Common
<i>Hyloxalus sp.</i>	0	1	0	1	Uncommon
<i>Eleutherodactylus sp.</i>	0	0	1	1	Uncommon
<i>Dendropsophus padreluna</i>	1	0	0	1	Uncommon
<i>Rheobates palmatus</i>	0	0	0	0	Rare

Table 5. Abundance status of the amphibians species found in November at Municipio de Supatá.

In this monthly sampling we registered a total of twenty nine amphibians; of those twelve were salamanders (41.3%) (Common status), fourteen were the golden poison frog of Supatá (48.2%) (Common status) and one individual of frog of *Hyloxalus* genus (3.4%), Padre Luna's treefrog (3.4%) and Rain frog (3.4%) (Uncommon status). we don't register any individual of Palm rocket frog (rare species).

On the other hand, in the first group of salamander's eggs we find only 12 eggs of which two were destroyed and two were infertile, surviving only the 53,3% of the eggs in this brood. In the second group one eggs isn't fertile, surviving only the 93, 7% of the eggs in this group.

We observe three males of golden poison frog carrying tadpoles; two carried a single tadpole and the other carried two.

The data obtained in December:

Date: 28 December / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°01' 48.8" N; 74°15' 21.3" W **Height:** 2102 meters a.s.l
Climate conditions: Cloudy **Initial temperature:** 15.8°C **Final temperature:** 17.3°C
Initial relative humidity: 72 % **Final relative humidity:** 82 %
Initial hour: 10:00 **Final hour:** 14:00 **Invested hours:** 4 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Bolitoglossa cf pandi</i>	F	10:00	Leaf litter
2.	<i>Bolitoglossa cf pandi</i>	J	10:03	Leaf litter
3.	<i>Ranitomeya</i> sp.	J	10:11	Leaf litter
4	<i>Ranitomeya</i> sp.	J	10:27	Leaf litter
5	<i>Bolitoglossa cf pandi</i>	M	10:45	Leaf litter
6	<i>Bolitoglossa cf pandi</i>	J	11:08	Leaf litter
7	<i>Ranitomeya</i> sp.	M	11:32	Leaf litter
8	<i>Ranitomeya</i> sp.	/	11:34	Leaf litter
9	<i>Bolitoglossa cf pandi</i>	M	12:04	Leaf litter
10	<i>Ranitomeya</i> sp.	/	12:40	Leaf litter
11	<i>Bolitoglossa cf pandi</i>	IM	13:17	Leaf litter
12	<i>Rheobates palmatus</i>	/	13:20	Stream

IM: Immature male

Date: 29 December / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°02' 05.0" N; 74°15' 48.2" W **Height:** 2088 meters a.s.l
Climate conditions: Cloudy-sunny **Initial temperature:** 15.8 °C **Final temperature:** 16.7°C
Initial relative humidity: 96 % **Final relative humidity:** 89 %
Initial hour: 10:00 **Final hour:** 13:00 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Ranitomeya</i> sp.	/	10:21	Leaf litter
2.	<i>Ranitomeya</i> sp.	M	10:22	Leaf litter
3.	<i>Bolitoglossa cf pandi</i>	J	10:44	Leaf litter
4	<i>Bolitoglossa cf pandi</i>	M	11:01	Leaf litter
5	<i>Bolitoglossa cf pandi</i>	F	11:35	Leaf litter
6	<i>Ranitomeya</i> sp.	/	12:20	Fallen bromeliad
7	<i>Ranitomeya</i> sp.	/	12:33	Fallen trunk
8	<i>Bolitoglossa cf pandi</i>	F	12:34	Fallen trunk
9	<i>Ranitomeya</i> sp.	M	12:57	Cave into root

Date: 30 December / 2007 **Site:** Cundinamarca, Supatá, vereda San Marcos
GPS position: 05°02' 14.3" N; 74°15' 46.6" W **Height:** 1945 meters a.s.l
Climate conditions: Cloudy-sunny **Initial temperature:** 16.2 °C **Final temperature:**
16.7°C **Initial relative humidity:** 66 % **Final relative humidity:** 95 %
Initial hour: 10:00 **Final hour:** 13:03 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Bolitoglossa cf pandi</i>	J	10:01	Leaf litter
2.	<i>Bolitoglossa cf pandi</i>	J	10:01	Leaf litter
3.	<i>Bolitoglossa cf pandi</i>	J	10:31	Leaf litter
4	<i>Ranitomeya sp.</i>	/	11:14	Leaf litter
5	<i>Ranitomeya sp.</i>	M	11:17	Cave into root
6	<i>Ranitomeya sp.</i>	/	12.10	Leaf litter
7	<i>Ranitomeya sp.</i>	F	12:12	Leaf litter
8	<i>Ranitomeya sp.</i>	M	12:27	Leaf litter
9	<i>Hyloxalus sp.</i>	/	12:48	Leaf litter
10	<i>Bolitoglossa cf pandi</i>	J	12:54	Leaf litter

Species	Number of individuals			Number of individuals / 10 hours Encounter rate X 10	Abundance Status
	1 day (4 Hours)	2 day (3 Hours)	3 day (3 Hours)		
<i>Bolitoglossa cf pandi</i>	6	4	4	14	Common
<i>Ranitomeya sp.</i>	5	5	5	15	Common
<i>Hyloxalus sp.</i>	0	0	1	1	Uncommon
<i>Eleutherodactylus sp.</i>	0	0	0	0	Rare
<i>Dendropsophus padreluna</i>	0	0	0	0	Rare
<i>Rheobates palmatus</i>	1	0	0	1	Uncommon

Table 5. Abundance status of the amphibians species found in December at Municipio de Supatá.

We registered in this month thirty one amphibians; the abundance status obtained in December for each species were: Common status for the salamanders (fourteen individuals) (45.1%) and the golden poison frog of Supatá (fifteen individuals) (48.3%); uncommon status for the frog of *Hyloxalus* genus (one individual) (3.2%) and the Palm rocket frog (one individual) (3.2%). We don't register individuals of rain frogs and Padre Luna's tree frogs classifying them as rare status.

In the brood number one we register five eggs destroyed and three infertile, surviving of the fifteen originally only two eggs (13, 3%) with embryo. In the other brood an egg disappeared and two are infertile, surviving with embryo the 81.25% of the eggs.

In December we could register two males of the golden poison frog of Supatá carrying three tadpoles in their back, each one.



Figure 18. The golden poison frog of Supatá a new species of dendrobatid from Colombia.
(Photograph by G. Chaves Portilla)



Figure 19. Ventral view of a female of the golden poison frog of Supatá
(Photograph by G. Chaves Portilla)



Figure 20. A female of salamander probably of the *Bolitoglossa pandi* species from Supatá.
(Photograph by G. Chaves Portilla)



Figure 21. A male of a dendrobatid of the *Hyloxalus* genus, possibly a new species of frog.
(Photograph by G. Chaves Portilla)

The most severe threats that confront the Supatá's amphibians and their habitats are the adaptation of lands for the raising cattle and the wooden extraction in the Andean forest relicts that exist in Supatá (See Figure 22); this destruction generates the decrease of the potential habitat of these amphibians, besides of degrades the last natural resources existent in the area.



Figure 22. The wooden extraction in an Andean forest relict in Supatá.
(Photograph by G. Chaves Portilla)

The contamination of the rivers, streams and other water formations by agrochemists and pesticides are also a serious threat to the amphibians in this zone, that together to the bad administration of the garbage make unfavorable conditions for the survival for all fauna of the region.

Municipio de San Francisco: the proximity of this municipality with Supatá transformed it in a place where potentially we could find some of the amphibians that we find in Supatá. 60 hours of capture effort were invested in this area reporting only the golden poison frog of Supatá (15 individuals) in the frontier of the two municipalities, and also we find 7 individuals of the Padre Luna's treefrog (Figure 13) and we listen some vocalizations of the Palm Rocket Frog (Figure 11). In this municipality, similarly that in Supatá, the deforestation problem is very severe, because great part of the forest areas were replaced for pea, corn and sugar's cane cultivations, but principally for grassland by livestock.

Municipio de Tena: The Laguna de Pedropalo's area is a place very important for the threatened amphibians. Here we find a population of salamander, which initially we thought was a new population of the salamander of Albán (*Bolitoglossa capitana*), but later studies demonstrated that was similar to the Pandi mushroom-tongue salamander (*Bolitoglossa pandi*), an endangered Andean salamander. Besides in this area exists

registrations the Inger's Big- Headed Frog (*Eleutherodactylus ingeri*), a vulnerable species (Figure 23).

In this municipality we invested 108 of capture effort in the explorations and additionally we were established for three months a research bases in de Pedropalo´s place among September and November of 2007. We perform a total of nine VES; three per month, with an effort of capture of 4, 3 and 3 hours/man respectively for a total of capture effort per month of 10 hours/man.

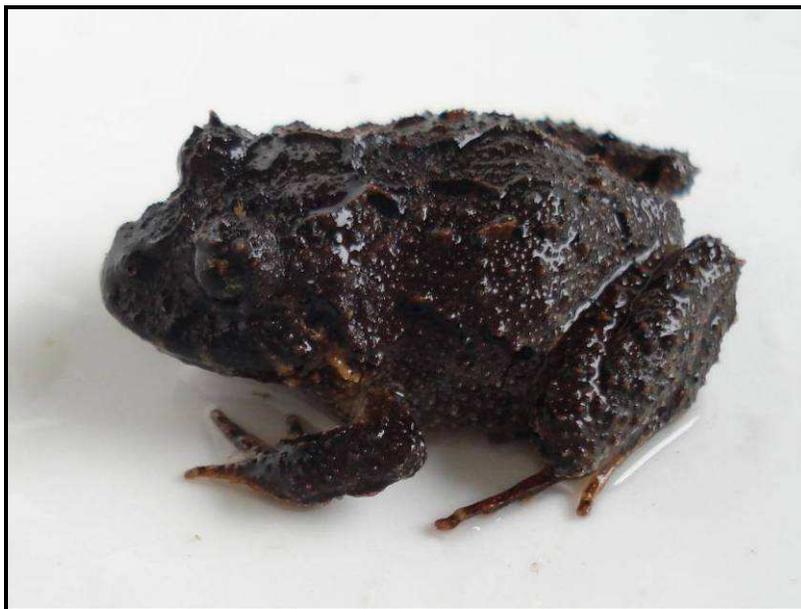


Figure 23. Juvenile of the Inger's Big-Headed Frog
(Photograph by J. Longas)

The data obtained in September:

Date: 28 September/ 2007 **Site:** Cundinamarca, Tena, vereda Catalamonte
GPS position: 04° 40' 53.3" N; 74° 23' 25.6" W **Height:** 2114 meters a.s.l
Climate conditions: Sunny **Initial temperature:** 15.6°C **Final temperature:** 17.8°C
Initial relative humidity: 77 % **Final relative humidity:** 69 %
Initial hour: 08:00 **Final hour:** 12:00 **Invested hours:** 4 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Eleutherodactylus bicolor</i>	/	8:15	Leaf Litter
2	<i>Eleutherodactylus unistrigatus</i>	/	8:30	Leaf Litter
3	<i>Eleutherodactylus unistrigatus</i>	J	8:49	Leaf Litter
4	<i>Eleutherodactylus unistrigatus</i>	/	9:05	Leaf Litter
5	<i>Eleutherodactylus unistrigatus</i>	J	9:20	Leaf Litter
6	<i>Eleutherodactylus unistrigatus</i>	J	9:40	Fallen trunk

Date: 29 September/ 2007 **Site:** Cundinamarca, Tena, vereda Catalamonte
GPS position: 04°41' 04.6" N; 74°23' 24.2" W **Height:** 2022 meters a.s.l
Climate conditions: Cloudy **Initial temperature:** 16.2°C **Final temperature:** 18.4°C
Initial relative humidity: 69 % **Final relative humidity:** 73 %
Initial hour: 08:00 **Final hour:** 11:00 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Eleutherodactylus</i> sp.	J	8:10	Encircling petiole
2	<i>Eleutherodactylus unistrigatus</i>	J	8:12	Encircling petiole
3	<i>Eleutherodactylus unistrigatus</i>	/	8:30	Encircling petiole
4	<i>Dendropsophus padreluna</i>	/	8:35	Encircling petiole
5	<i>Dendropsophus padreluna</i>	/	9:03	Encircling petiole
6	<i>Eleutherodactylus unistrigatus</i>	F	9:35	Encircling petiole
7	<i>Eleutherodactylus unistrigatus</i>	/	9:40	Encircling petiole
8	<i>Eleutherodactylus unistrigatus</i>	/	9:40	Encircling petiole
9	<i>Eleutherodactylus unistrigatus</i>	/	10:03	Encircling petiole
10	<i>Eleutherodactylus unistrigatus</i>	/	10:05	Fallen trunk
11	<i>Eleutherodactylus</i> sp.	/	10:10	Encircling petiole
12	<i>Eleutherodactylus unistrigatus</i>	/	10:11	Encircling petiole
13	<i>Eleutherodactylus</i> sp.	/	10:15	Encircling petiole
14	<i>Eleutherodactylus unistrigatus</i>	J	10:25	Encircling petiole
15	<i>Dendropsophus padreluna</i>	/	10:35	Encircling petiole
16	<i>Dendropsophus padreluna</i>	/	10:39	Encircling petiole

Date: 30 September / 2007 **Site:** Cundinamarca, Tena, vereda Catalamonte
GPS position: 04°41' 04.6" N; 74°23' 24.2" W **Height:** 2022 meters a.s.l
Climate conditions: Cloudy **Initial temperature:** 16.2°C **Final temperature:** 18.4°C
Initial relative humidity: 69 % **Final relative humidity:** 73 %
Initial hour: 08:00 **Final hour:** 11:00 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Eleutherodactylus unistrigatus</i>	J	8:05	Encircling petiole
2	<i>Eleutherodactylus unistrigatus</i>	J	8:15	Encircling petiole
3	<i>Dendropsophus padreluna</i>	/	9:05	Encircling petiole
4	<i>Eleutherodactylus unistrigatus</i>	/	9:05	Encircling petiole
5	<i>Eleutherodactylus</i> sp.	/	10:45	Encircling petiole
6	<i>Eleutherodactylus unistrigatus</i>	F	10:49	Encircling petiole

Species	Number of individuals per each observer (3 observers)			Number of individuals / 10 hours Encounter rate X 10	Abundance Status
	1 (4 Hours)	2 (3 Hours)	3 (3 Hours)		
<i>Eleutherodactylus bicolor</i>	1	0	0	1	Uncommon
<i>Eleutherodactylus unistrigatus</i>	5	9	4	18	Common
<i>Eleutherodactylus sp.</i>	0	3	1	4	Frequent
<i>Dendropsophus padreluna</i>	0	4	1	5	Frequent
<i>Bolitoglossa cf. pandi</i>	0	0	0	0	Rare
<i>Eleutherodactylus ingeri</i>	0	0	0	0	Rare

Table 6. Abundance status of the amphibians species found in September at Pedropalo's area.

The abundance status obtained in September for each species was: Uncommon status for the *Eleutherodactylus bicolor* (a single individual) (3.5%); common status for *Eleutherodactylus unistrigatus* (with eighteen individuals) (64.2%); frequent status for *Eleutherodactylus sp.* (Four individuals) (14.2%) and *Dendropsophus padreluna* (five individuals) (17.8%); and rare status for *Bolitoglossa cf. pandi* and *Eleutherodactylus ingeri* with any registered individual.

The data obtained in October:

Date: 17 October / 2007 **Site:** Cundinamarca, Tena, vereda Catalamonte
GPS position: 04°40' 25.8" N; 74°23' 28.9" W **Height:** 1967 meters a.s.l
Climate conditions: Rainy **Initial temperature:** 14.4°C **Final temperature:** 16.6°C
Initial relative humidity: 82 % **Final relative humidity:** 78 %
Initial hour: 08:00 **Final hour:** 12:00 **Invested hours:** 4 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Bolitoglossa cf. pandi</i>	F	9:05	Fallen bromeliad
2	<i>Eleutherodactylus unistrigatus</i>	/	10:15	Leaf litter

Date: 18 October / 2007 **Site:** Cundinamarca, Tena, vereda Catalamonte
GPS position: 04°40' 42.6" N; 74°23' 56.2" W **Height:** 2100 meters a.s.l
Climate conditions: Cloudy **Initial temperature:** 16.7°C **Final temperature:** 17.6°C
Initial relative humidity: 75 % **Final relative humidity:** 65 %
Initial hour: 08:00 **Final hour:** 11:00 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Bolitoglossa cf. pandi</i>	M	8:12	Under rock
2	<i>Eleutherodactylus unistrigatus</i>	/	09:15	Leaf litter
3	<i>Eleutherodactylus unistrigatus</i>	/	09:45	Leaf litter
4	<i>Bolitoglossa cf. pandi</i>	F	10:25	Leaf litter
5	<i>Eleutherodactylus sp.</i>	J	10:32	Encircling petiole
6	<i>Bolitoglossa cf. pandi</i>	F	10:40	Encircling petiole
7	<i>Eleutherodactylus unistrigatus</i>	J	10:45	Leaf litter

Date: 19 October / 2007 **Site:** Cundinamarca, Tena, vereda Catalamonte
GPS position: 04°40' 12.1" N; 74°22' 58.7" W **Height:** 1989 meters a.s.l
Climate conditions: Cloudy **Initial temperature:** 16.3°C **Final temperature:** 17.9°C
Initial relative humidity: 65 % **Final relative humidity:** 76 %
Initial hour: 08:00 **Final hour:** 11:00 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Eleutherodactylus unistrigatus</i>	J	8:07	Leaf Litter
2	<i>Bolitoglossa cf. pandi</i>	J	8:30	Leaf Litter
3	<i>Bolitoglossa cf. pandi</i>	F	8:55	Leaf Litter
4	<i>Eleutherodactylus ingeri</i>	/	9:30	Leaf Litter
5	<i>Bolitoglossa cf. pandi</i>	/	9:32	Leaf Litter
6	<i>Eleutherodactylus unistrigatus</i>	F	9:42	Leaf Litter
7	<i>Eleutherodactylus sp.</i>	/	10:22	Leaf Litter
8	<i>Eleutherodactylus sp.</i>	/	10:36	Leaf Litter
9	<i>Eleutherodactylus sp.</i>	/	10:42	Leaf Litter
10	<i>Bolitoglossa cf. pandi</i>	F	10:55	Leaf Litter

Species	Number of individuals per each observer (3 observers)			Number of individuals / 10 hours Encounter rate X 10	Abundance Status
	1 (4 Hours)	2 (3 Hours)	3 (3 Hours)		
<i>Eleutherodactylus bicolor</i>	0	0	0	0	Rare
<i>Eleutherodactylus unistrigatus</i>	1	3	2	6	Frequent
<i>Eleutherodactylus</i> sp.	0	1	3	4	Frequent
<i>Dendropsophus padreluna</i>	0	0	0	0	Rare
<i>Bolitoglossa</i> cf. <i>pandi</i>	1	3	4	8	Frequent
<i>Eleutherodactylus ingeri</i>	0	0	1	1	Uncommon

Table 7. Abundance status of the amphibians species found in October at Pedropalo's area.

In this monthly sampling, the abundance status obtained was: Rare status for *Eleutherodactylus bicolor* and *Dendropsophus padreluna* without any registrations; frequent for *Eleutherodactylus unistrigatus* (with six individuals) (31.5%), *Eleutherodactylus* sp. (with four individuals) (21.0%) and *Bolitoglossa* cf. *pandi* (with eight individuals) (42.1%); and uncommon status for *Eleutherodactylus ingeri* with a single individual (5.2%).

The data obtained in November:

Date: 15 November / 2007 **Site:** Cundinamarca, Tena, vereda Catalamonte
GPS position: 04°38' 25.7" N; 74°18' 30.2" W **Height:** 2015 meters a.s.l
Climate conditions: Sunny **Initial temperature:** 16.9°C **Final temperature:** 17.4°C
Initial relative humidity: 72 % **Final relative humidity:** 75 %
Initial hour: 08:00 **Final hour:** 12:00 **Invested hours:** 4 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Dendropsophus padreluna</i>	/	8:06	Encircling petiole
2	<i>Bolitoglossa</i> cf. <i>pandi</i>	F	8:32	Leaf Litter
3	<i>Eleutherodactylus</i> sp.	/	8:42	Leaf Litter
4	<i>Eleutherodactylus unistrigatus</i>	/	9:07	Leaf Litter
5	<i>Bolitoglossa</i> cf. <i>pandi</i>	F	9:18	Leaf Litter
6	<i>Eleutherodactylus unistrigatus</i>	F	9:35	Leaf Litter
7	<i>Eleutherodactylus</i> sp.	/	10:05	Leaf Litter
8	<i>Bolitoglossa</i> cf. <i>pandi</i>	J	10:18	Leaf Litter
9	<i>Bolitoglossa</i> cf. <i>pandi</i>	F	10:26	Leaf Litter
10	<i>Bolitoglossa</i> cf. <i>pandi</i>	F	10:43	Leaf Litter
11	<i>Bolitoglossa</i> cf. <i>pandi</i>	J	10:56	Leaf Litter
12	<i>Bolitoglossa</i> cf. <i>pandi</i>	J	11:12	Leaf Litter
13	<i>Eleutherodactylus unistrigatus</i>	/	11:34	Leaf Litter
14	<i>Eleutherodactylus unistrigatus</i>	/	11:56	Leaf Litter

Date: 16 November / 2007 **Site:** Cundinamarca, Tena, vereda Catalamonte
GPS position: 04°46' 27.7" N; 74°32' 12.7" W **Height:** 1979 meters a.s.l
Climate conditions: Cloudy **Initial temperature:** 14.6°C **Final temperature:** 16.8°C
Initial relative humidity: 84% **Final relative humidity:** 79 %
Initial hour: 08:00 **Final hour:** 11:00 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Eleutherodactylus bicolor</i>	/	8:33	Leaf Litter
2	<i>Eleutherodactylus unistrigatus</i>	J	8:45	Leaf Litter
3	<i>Eleutherodactylus sp.</i>	/	8:58	Leaf Litter
4	<i>Eleutherodactylus unistrigatus</i>	J	9:14	Leaf Litter
5	<i>Eleutherodactylus bicolor</i>	/	9:36	Leaf Litter
6	<i>Eleutherodactylus unistrigatus</i>	/	10:37	Leaf Litter

Date: 17 November / 2007 **Site:** Cundinamarca, Tena, vereda Catalamonte
GPS position: 04°53' 57.8" N; 74°28' 42.1" W **Height:** 2130 meters a.s.l
Climate conditions: Cloudy **Initial temperature:** 15.5°C **Final temperature:** 17.8°C
Initial relative humidity: 79% **Final relative humidity:** 82 %
Initial hour: 08:00 **Final hour:** 11:00 **Invested hours:** 3 hours/man

#	Species	Sex	Hour	Microhabitat
1	<i>Eleutherodactylus unistrigatus</i>	/	8:07	Encircling petiole
2	<i>Eleutherodactylus sp.</i>	/	8:31	Leaf Litter
3	<i>Dendropsophus padreluna</i>	/	9:30	Leaf Litter
4	<i>Dendropsophus padreluna</i>	/	9:32	Encircling petiole
5	<i>Dendropsophus padreluna</i>	/	9:57	Leaf Litter
6	<i>Eleutherodactylus unistrigatus</i>	/	10:13	Leaf Litter
7	<i>Eleutherodactylus sp.</i>	/	10:50	Leaf Litter

Species	Number of individuals per each observer (3 observers)			Number of individuals / 10 hours Encounter rate X 10	Abundance Status
	1 (4 Hours)	2 (3 Hours)	3 (3 Hours)		
<i>Eleutherodactylus bicolor</i>	0	2	0	2	Uncommon
<i>Eleutherodactylus unistrigatus</i>	4	3	2	9	Frequent
<i>Eleutherodactylus sp.</i>	2	1	2	5	Frequent
<i>Dendropsophus padreluna</i>	1	0	3	4	Frequent
<i>Bolitoglossa cf. pandi</i>	7	0	0	7	Frequent
<i>Eleutherodactylus ingeri</i>	0	0	0	0	Rare

Table 8. Abundance status of the amphibians species found in November at Pedropalo´s area.

The abundance status obtained in November for the species located in this area were: Uncommon status *Eleutherodactylus bicolor* (with two individuals) (7.4%); frequent status for *Eleutherodactylus unistrigatus* (with nine individuals) (33.3%), *Eleutherodactylus* sp. (with five individuals) (18.5%), *Dendropsophus padreluna* (with four individuals) (14.8%) and *Bolitoglossa* cf. *pandi* (with seven individuals) (25.9%); and rare status for *Eleutherodactylus ingeri* without any found individual.

ENVIRONMENTAL WORK:

In the places where we developed explorations and the fieldwork, we performed chats with the rural people that live near of these areas. This informative phase was based on the necessity to awareness to the rural communities about the significance of to protect and to conserve the fauna and flora of these regions and to show the importance and the many services that provide the amphibians to ecosystems and the humanity. This environmental work was directed to the children and young people mainly, but the mature people also participated in many of these journeys.

In some explorations we allow that some children to accompany us so that they directly could to see, to touch and to feel many of the things of the wild life. In this long walks we explained to they the importance of each one of the things that there is in the forest (Figure 24 and 25).



Figure 24. Girl with a frog in her hands in a long walk at Pedropalo's area
(Photograph by G. Chaves Portilla)

With the discovery of the golden poison frog of Supatá a good opportunity was given to work with the community in the Municipio de Supatá. The first step was the realization of a poster with the support of Conservation International Colombia which allowed disclosing this discovery in the area (Figure 26). Later on we were carried out some

chats with children and young of the area to show the importance of this discovery and the imperious necessity of to protect and to conserve the amphibians and their natural habitats (Figure 27 and 28).



Figure 24. Journey of environmental education with rural people in the forest where we find the golden poison frog of Supatá.
(Photograph by G. Chaves Portilla)

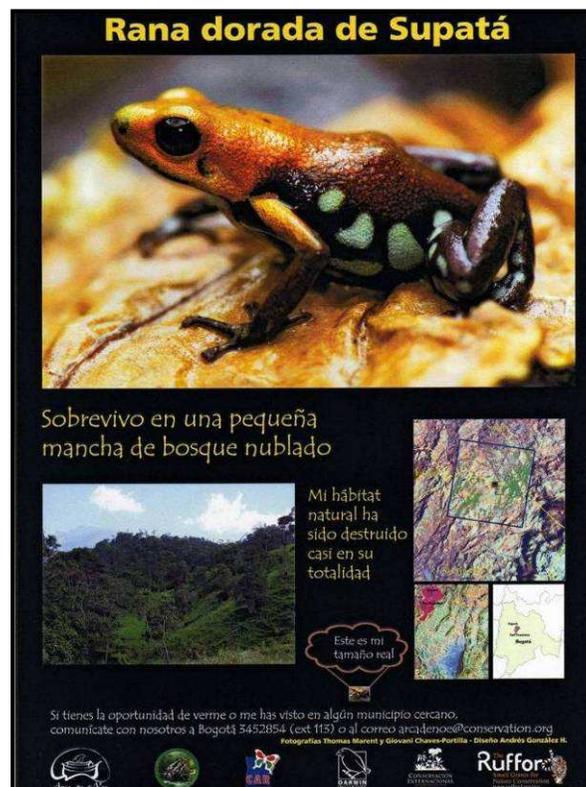


Figure 25. Poster of the golden poison frog of Supatá



Figure 26. Young people that participated in a journey environmental informative in Supatá.
(Photograph by G. Chaves Portilla)



Figure 27. Some children recognizing the golden poison frog of Supatá.
(Photograph by G. Chaves Portilla)

Achievements reached in the phase of environmental education:

- ✓ Awareness of many rural people (mainly children and young) about urgent necessity of protecting the last natural recourses in Cundinamarca department.
- ✓ Chats and activities that exposed the current concern about the amphibian decline and the importance of these animals in the ecosystem and the implications if these disappear.
- ✓ Appropriation by the inhabitants of Supatá of the new species of poisonous frog; is possible that in a near future this frog will be adopted as badge of the municipality.
- ✓ Popularization in several Colombian and foreigner media about the discovery of the golden frog of Supatá, this news facilitated the work partly with the people.

RECOMMENDATIONS

Although in this project was not possible to register the involved species, is necessary to continue the searches of these amphibians in other forest fragments that still exists in Cundinamarca department. The quick disappearance of these two amphibians, *Bolitoglossa capitana* and *Atelopus farci*, demonstrates the serious threatens that is confronting the amphibians around the world.

But not everything is bad news, with the discoveries of new species of amphibians and new possible populations of threatened amphibians achieved in this project, a good possibility opened up to study and to know different aspects of these amphibians, we recommend to continue the ecology and natural history studies at longer time, also is required to carry out a monitory project of these amphibian populations and to explore near area to know the current distribution of these animals. This gathered information will allow us to have a wider knowledge of these amphibians, which will be useful in the creation of conservation plans for these species and their habitats. Finally, we recommend continuing the environmental work, mainly in the Municipio de Supatá, since we are convinced that these works with the human communities are the tools most important that we have to protect the last natural resources.

The Fundación Ecodiversidad Colombia will continue with the purpose to work for the Colombian nature and we will maintain the environmental and field work in the Municipio de Supatá trying to conserve the amphibiafauna of this region.

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