

THE PROTECTION AND MANAGEMENT OF PRIMATES  
IN SUCRE AND CORDOBA (COLOMBIA).

A Report to the New York Zoological Society  
Regarding Studies Carried Out in Colombia, South America, June - Sept. 1977 (1)

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OBJECTIVES:

1. The investigation of possible reserve sites for primate populations, especially Saguinus o. oedipus, the cotton-top tamarin, in Sucre and Cordoba.
2. Continuation of the study on the ecology and social organization of Saguinus o. oedipus previously begun by the author at a site near Tolú. Sucre ("S", Map 1).
3. Finalization of a report in Spanish on the above project, including recommendations for the management of Saguinus o. oedipus in semi-natural forests and steps which need to be taken to insure its survival. (Title: "El Titi Cabeza-Blanca (Saguinus oedipus) Linnaeus, 1758, de la Costa Caribe de Colombia"). A copy of that work is included with this report.

ACTIVITIES:

- I. The following areas were visited during the Reserve Reconnaissance (September 2-6, 11-17).
  - a. The area of Colosó, Sucre (No. 1 on map, circled in red).
  - b. The area E. of Macajan, Sucre (No. 2, circled in red).
  - c. The area of Monterfa, Cordoba.
  - d. The upper Sinú between Tierralta and the Caserío Mata Guineo just above the mouth of the Rio Verde (No. 3, circled in red).
- II. Five weeks were spent at the Study Site (July 23-Sept. 1, Sept. 8-9).
  - a. Twenty-seven tamarins were captured, (14 previously marked, 13 new).
  - b. The data shown on Figure 1 were taken for each individual captured.
  - c. The current compositions of three groups were ascertained and of two others, partially.
- III. Nearly four weeks were spent in Bogotá on arrival in country, (June 26-July 23). During this period:
  - a. Official Inderena papers necessary to proceed with the project were drawn up and signed.
  - b. Final corrections were made on the Spanish report, and arrangements made for the completion of drawings and typing during the interim of my visit to the coast.
  - c. I was assigned a Colombian "coinvestigator" to accompany me, in accordance with newly established requirements for foreign investigators. (2)
- IV. Ten days were spent in Bogotá prior to leaving the country (Sept. 18-29), during which:
  - a. Corrections were made on the final typed draft of the Spanish report, totaling about 150 pages.
  - b. We arranged for Inderena to make 20 copies of the report, and drew up a list of intended recipients (the large majority in Colombia).
  - c. An hour-long slide-illustrated talk presenting the major results of

the Tolú study was given, in Spanish, in accordance with another recently adopted Colombian requirement for foreign investigators.

RESERVE SITE RECONNAISSANCE

A. Observations

1. In Bogota on arriving I learned that since my 1976 visit Inderena had declared a number of new parks and reserve areas, including several within the geographic distribution of Saguinus o. oedipus (see map). In many of these the status of Saguinus o. oedipus and other primates is unknown. It was decided, however, in discussions with Dr. Carlos Mejía, present head of Proyecto Primates (3), that this project should concentrate on areas near Macajan-Colosó and the South Cordoba area if it proved to be safe to visit. A PAHO-funded team (4) in search of Aotus populations was to visit concurrently many forests farther north.
2. Visit to Southern Serranía de San Jacinto (outer hills nearest Colosó and Macajan--areas 1 and 2 circled in red on map).
  - a. The bottom lands and adjacent less inclined hillsides have been cleared cut. They are used for pasturing cattle or planting corn, plantain, manioc, or tobacco. The only forest still remaining stands on steep rock outcrop and rubble with so little surface soil that arability is nil or minimal. Included is primary forest which still has many tree species exceeding 100 ft. in height and 6 ft. in diameter (including buttresses). Certain species are being selectively cut, and the sawed lumber dragged out by mule over narrow paths. Adjacent to and in some cases within the primary areas is secondary growth of varying ages and new or old planted areas. Some regrowth is now being cut for at least the second time.
  - b. The Serranía was visited on two sides: the sites were about 10 km apart. On the hillsides nearest Colosó one landowner claimed to own about 100 Ha of primary forest (that he might consider selling since his primary source of income is tobacco farming). The total forest on those near-Colosó hillsides was estimated at several hundred Ha. The owner contacted on the Macajan side said he owned some 115 Ha in forest, and that he was looking for a buyer. This forest was similar in physiognomy and species composition to that on the Colosó side - and all three persons consulted agreed that the forest extends across the Serranía. The situation within the Serranía itself was not investigated. It is relatively inaccessible as only foot trails penetrate the area, and would perhaps best be surveyed by air. The chances are very good that 1000 Ha or more of forest, much of it primary, still exist in the Southern Serranía de San Jacinto.
  - c. In the forest areas visited near Colosó we were able to verify by sight the presence of Saguinus o. oedipus, Ateles belzebuth robustus, Alouatta seniculus, and Cebus capucinus. Aotus trivirgatus (subsp. not verified) was said to be present. On the Macajan side Ateles were heard but not seen, and the other 4 species are said to be present. The Ateles are hunted for food and apparently kept to the taller forest. Alouatta and Cebus were seen in what appeared to be old secondary growth judging by the presence of trees to about 70

ft. and 3 ft. across and a mixture of species seen in primary areas plus occasional *Cecropia* and *Bursera simaruba*. *Cebus* and *Saguinus* were seen in lower forest with trees not exceeding 45 ft. and few specimens exceeding 1 ft. in diameter.

### 3. Visit to Montería

- a. The recently formed CVS (Corporación Autónoma Regional de los Valles del Sinú y San Jorge) is now effectively in charge of the protection of Córdoba's natural resources. Because CVS is bound by national law, however, the newly declared reserve in South Córdoba should be recognized and protected by CVS. In discussions with Dr. Juan González Petro (Jefe, División Cuencas Hidrográficas) several points were made which are relevant to the future of the fauna of the newly declared park area.
  1. Three dams are planned for the Upper Sinú and its tributaries. Work on the lowermost is scheduled to begin in 1978.
  2. The park area includes much of the watershed for the dams (except the lowermost). Since the protection of the watershed is a primary concern of CVS, this may imply protection of the fauna inhabiting it. On the other hand, access roads will inevitably be created in the process of making the dams, thereby making easily reachable an area that presently is relatively inaccessible and increasing the population in the area. Although vast, the area is now relatively easy to control because all lumber must be transported by river. CVS monitors forest usage through check points along the river.
  3. Vast areas will be flooded. Within the flooded area any populations surviving because of inhabiting higher ground will become isolated even if they now are not.
  4. It is felt that the fauna and flora within the area to be flooded should be utilized and permits are being issued to this end.
- b. It was felt that a major contribution to faunal preservation in Córdoba would be a park near Montería with the double purpose of recreation and education of the public about conservation and ecology. Such facilities are completely lacking despite Montería's sizeable population and its importance as the capital of the Department. It was suggested that CVS would contemplate a matching-funds type project with this objective. The system of Ciénagas bordering the Sinú on the side opposite Montería, presently public property in theory but unprotected and undeveloped, was suggested as a possible site. In a very short visit to one such area we saw *Alouatta seniculus*.
- c. An unsuccessful attempt was made to arrange for a Professor who teaches ecology in the Universidad de Córdoba near Montería to accompany me on the visit to Tierralta and the upper Sinú (see below).

### 4. Visit to Tierralta and trip up Sinú.

- a. Tierralta is accessible by either road or air; from that point on all access is by river. Certain areas are considered inaccessible because of guerrilla control. We traveled as far up the Rio Sinú as was considered safe, reaching in some 6 hours the Caserío Mata Guineo at a point between the mouths of the Rio Verde and Rio Esmeralda (site 3, circled in red on map). CVS kindly cooperated with the loan of a boat and motor and the accompaniment of an Inspector (Sr. Jill Ortega) and a guide (see below). Gasoline, food and the guide's sal-

ary were paid from the Society's funds.

- b. Around Tierralta and between there and Tocurá (underlined in red on map) there are only a very few forest patches left in sight of the river. Sr. Jesus Jimenez, the guide, said that forest with monkeys, (especially *Ateles*) could be found only some hours by horse from Tierralta. The latter town although quite small is said to be older than Montería, having been established in the early 1900's.
- c. Around Tocurá, *Saguinus o. oedipus* has become scarce - chiefly due to the fact that the area is largely devoted to pasture as far from the river as the eye can see. Sr. Jimenez recounted that when he first became acquainted with Tocurá in the 1930's secondary growth ("rastrajo") was common in the area and so were *Saguinus o. oedipus*, which frequented it. Exporters were said, however, to have removed (bought) huge numbers in the years previous to the 1975 initiation of the present trade ban - which seems to have been effective in inhibiting that trade. In areas some distance from the river there may still remain some *Saguinus o. oedipus* populations of unknown size.
- d. Above Tocurá more forest is present but the primary portion is limited largely to remnants at the tops of hills. While travelling downstream along the stretch of the Sinú just above the Rio Verde I counted the proportions of seconds that were spent passing cleared land or regrowth (left bank) versus the number where apparently untouched primary forest was passed. Only 57/300 counted seconds fell into the latter category - that is, at least close to the Sinú human impact on the area has already been considerable. Some vegetation which is quite high is actually secondary growth, as is obvious from comparing it to the adjacent primary (these two types might not be distinguishable from the air). Inhabitants of the region are Indians of the Catio tribe who frequently do not settle permanently on a site but will farm an area adjacent to the river for some years and then move. Abandoned houses are common.
- e. We visited briefly some primary forest near Mata Guineo and talked to an Indian who reportedly had lived in that area since childhood. He spoke Spanish and said he was giving me the Spanish (as opposed to Quechua) names for trees. He was in agreement with Sr. Jimenez that *Saguinus o. oedipus* did not and never had existed in the area. A species of *Ateles* is present - presumably the same as the one found farther north. "Mico de Noche" (*Aotus* possibly) and *Cebus* were said to be present. (Unfortunately did not specifically ask about *Alouatta*; but my informers did state that "no other types of monkeys" were present). The primary forest was similar in physiognomy to that of the Sierranía de San Lucas, but with fewer epiphytes, more palms, soil rather than rocks as the dominant substrate, and composed of entirely different tree species. None of the easily recognizable species from the Northern forest were present; many were present here that had not been present in the North. The altitude in this area was low, less than 200 m. It lies approximately on the boundary of the newly declared Reserve area (see map).
- f. The limit of *Saguinus o. oedipus* distribution along the Sinú thus lies somewhere between Tocurá and Mata Guineo. This was unexpected, as the whole area lies below the previously presumed altitudinal limit for *Saguinus o. oedipus*. Some species of trees that the species utilizes at the Tolá study site occur along the riverbank all the way up to Mata Guineo, as do patches of secondary growth which they are

presumed to prefer. For example various Inga species, Anacardium excelsum, Spondias mombin, and Cecropia are present. Why then does Saguinus o. oedipus not occur in the Mata Guineo area? Perhaps although species of trees that constitute possible resources are present, their quantity or distribution somehow limits the spread of the species up the river. Another idea was offered by Sr. Jimenez. He observed that Saguinus o. oedipus only occurs in level areas and does not inhabit steep riverbanks such as are characteristic of the Mata Guineo area. Around Tocurá, by contrast, there is a considerable flood plain. He observed that Saguinus o. oedipus is common in the Manso river basin, also characteristically of low profile. Competitive exclusion is still another possibility in theory, but no other Callitrichid occurs in the area.

#### B. Conclusions and recommendations

1. Saguinus o. oedipus: The data resulting from the PAHO group's reconnaissance should be incorporated into any overall picture regarding Saguinus o. oedipus, although the majority of forests they visited were too small to constitute viable long-term reserves. Contrary to what was expected, the Southern Cordoba area populations may be limited not by altitude but by some factor related to riverine vegetation and floodplain formation. The newly declared park area may be of minimal value for the preservation of Saguinus o. oedipus populations, if what was observed on the Sinú has generality.\* Remaining populations of the species are in that case even fewer than previously thought, based on the extent of forest on the coast north of their 500 m. presumed altitude limit in the Andes foothills (Neyman, 1977).
  - a. The limits of Saguinus o. oedipus distribution should be explored in the San Jorge river area and to the west.\*
  - b. In order to investigate further the factors that limit the distribution of the species, further explorations from the Tierralta and Tocurá area should be made. The tributaries of the Sinú could be traversed to see whether the species drops out with the absence of flood plains.
2. Southern Serranía de San Jacinto: The primary forest in the Southern Serranía de San Jacinto seems highly worthy of preservation on several counts:
  - a. Its extension could potentially reach 1000 Ha or more.
  - b. Since it is on non-arable land, its best use is as forest. The pressures against its preservation as forest would be less than in many areas. The primary crop in the Colosó area is tobacco; hunting and wood extraction are secondary sources of income. The number of subsistence farmers seems to be relatively few and there are other alternatives in the area for those people.
  - c. It contains five species of primates, including one endangered subspecies (Saguinus o. oedipus) and two others rare if not endangered (Ateles belzebuth robustus, Aotus trivirgatus griseimembra? - not verified but probable). Study of its vegetation and avifauna would probably reveal endemic species.
  - d. Protection of the area could be facilitated by public education of the inhabitants of Colosó. The town is proud of its high literacy rate and runs its own schools. The citizenry seems to have a favorable attitude toward conservation. If a Reserve also brought income to Colosó in some form, eg. tourism, it would be even better received.

\* See Spanish report for more extensive discussion.

#### ACTIVITIES AT STUDY SITE

##### A. Saguinus o. oedipus study results

1. The measurements and observations shown in the sample data sheet (Figure 1) were taken on each of the 27 individuals captured. Some recaptures were of animals marked 3 years previously. Permanent ear tags were placed on all captured individuals. The plan to make tooth casts of all was discarded because of technical problems with the alginate mold material (Jelltrate) and the cast material (plaster of Paris). I still believe the casting technique to be of tremendous potential for setting up the aging criteria essential to population structure analysis, but the problem is capturing the fine detail required for documenting wear in such small teeth. Even very small bubbles in either the Jelltrate or the plaster potentially have a large effect. Dental wax was also tried as a molding material. Here the problem was the impossibility of separation of mold from the plaster without breaking the latter. Melting the wax out was not very satisfactory. Perhaps a latex-type substance which is painted onto the teeth would be less subject to surface distortion from bubbles. An epoxy material now being used for casts is also a possibility.

A series of photographs (Example Figure 2) from various angles were taken of most captured individuals' teeth, using close-up lenses. They provide a gestalt - probably the ultimate criterion in the end for forming an aging series - which compliments actual measurements. The photographs could be more important than I had at first anticipated. It became apparent that canine length measurements alone may be insufficient for documenting wear, due to gum recession. The latter phenomenon probably accounts for the fact that length measurements were greater for some individuals this year than last. Repeatability of measurements may also be a problem, as the degree of wear per year has turned out to be much less than anticipated. The latter result is interesting in itself, however, for it seems to indicate that longevity in the wild for this species could at least sometimes be well over 6 years, the maximum documented in captivity. (Napier & Napier, 1967)

2. Group stability and reproduction pattern fitted what was seen in previous years. Reproduction had occurred in some groups and apparently not in others during the intervening year since my last visit. Movement of individuals between groups was apparent: and in one territory an entirely new group was present, composed partly of unmarked (i.e. new?) individuals and partly of marked ones formerly members of groups inhabiting other territories in the study area.
3. A composite map of all group sightings showed that the groups present were utilizing areas of approximately if not exactly the same boundaries as utilized by groups during the previous years of observation, despite the drastically changed compositions in two cases.
4. One of the most-studied groups from previous years could not be induced to approach the traps this year, despite intensive efforts to attract them in several sites within their territory. This is, I believe, an experience to be noted as a warning against allowing persons inexperienced