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Biospeleology of the Macaregua Cave (Colombia)

By

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Resumen

Se describe los hallazgos en una cueva de San Gil (Santander, Colombia) la cual estaba infestada con histoplasma.

Summary

A description of the findings in an unusual cave in San Gil (Santander, Colombia), infested with histoplasma.

Near the village of San Gil in the department of Santander in central Colombia there is a large cave that is said to run for several miles. The one known entrance is almost closed by sliding rocks, but the numerous rooms adjoining this entrance are large (approx. 500 meters) and there is a stream which runs through the center. All is completely dark and the only sounds are those of running water and of thousand of roosting bats.

This cave "Macaregua" has been known from historical times and is reported to have been the burying ground of Indians. The cave is surrounded by many tales; that it contains fabulous riches buried with the Indians, that all manner of strange animals live there, but as it is sacred ground of the Indians, it contains a curse, and whoever enters becomes ill. In spite of the desire to hunt for these riches, and the fact that large amount of guano could be sold for fertilizer, none of the villagers will enter. This tale is so well believed that for years no one would venture to go in. About 13 years ago a group of 15 persons overcame their superstition and went in hoping to find either gold or strange animals, however because of the darkness, foul air and fear of being lost they found nothing of interest, but true to history, 2 weeks later all became ill. Thus from that day on the cave had no more visitors.

During a study of human diseases transmitted by bats carried on at the "Universidad de los Andes" in Bogotá, Colombia, it was thought to

be of interest to investigate the cave, not only because of the number of bats it contained but because the stories concerning it sounded as if it was infected with histoplasma. Several of the histories of the persons who had entered the cave 13 years ago were obtained and they showed that all had high intermittant fever, cough and chest pains.

In November 1966, two biologists from the "Universidad de los Andes" went into the cave to explore and to capture bats for the study which was in progress, both were histoplasmin positive. They found that the cave was inhabited by some 10,000 *Mormoops megalophylla* and approximately 50 *Natalus tumidirostris*. On the second visit in April 1967, there were only about 150 *M. megalophylla* present, while approximately 500 lactating females and a few males of *N. tumidirostris* were found. Also a large "nursery" of several hundred newborn *N. tumidirostris* was found at a distance of about 10—15 meters from the lactating females. This is the first observation of a bat nursery in a species not belonging to the Vespertilionidae in South America.

In May and August of the same year, still very few *M. megalophylla* and adult *N. tumidirostris* males were present. When the cave was visited again in October 1967 it was found that the number and species of bats was similar to those found in November 1966, and sexually active males of *N. tumidirostris* were present in equal numbers to non-pregnant females. During the spring and fall of 1968 the same pattern was observed. It was also noted that the temperature in the entrance of the cave where the majority of *N. tumidirostris* were found was approximately 21° C but that farther inside where the *M. megalophylla* were found the temperature was 28° C. The variation in the bat population is unusual as these two species are not known to change their living abodes.

On examination of the blood slides of the bats, one *N. tumidirostris* revealed the presence of abundant forms of a *Borrelia* sp. (C. J. MARINKELLE & E. S. GROSE 1968). This is the first report for America of a bat harboring *Borrelia* and the first finding of a heavy infection with this microorganism in a vertebrate in America. Although several hundred bats were examined for the presence of borrelias and trypanosomes, no additional case of borrelia and no trypanosomes were found. The fact that only one bat was found to be infected would suggest that it became infected accidentally.

Another unusual finding was the presence of several million adult and nymphal forms of the soft tick *Antricola mexicanus*, crawling over and feeding on the guano. These ticks have never before been recorded from South America.

Histoplasma capsulatum was isolated from the organs of 12 bats, and a new candida, *Candida chiropterorum* (E. S. GROSE & C. J. MARINKELLE 1968) was isolated from the organs of 19 bats.

In order to check whether or not man could become easily infected

when entering the cave (the first two volunteers from the "Universidad de los Andes" were histoplasmin positive), 7 histoplasmin negative volunteers were exposed for 2—4 hours inside the cave. As the volunteers were actually engaged in the collection of bats, their respiration increased due to the exercise and the air they inhaled was constantly in movement due to the thousand of bats. All volunteers showed a strong positive skin reaction when retested 5—6 weeks after their visit.

Two of the volunteers were without symptoms but the other five became sick 14—16 days after exposure and all complained of fatigue, headache, moderate fever, pain on inspiration and cough and were confined to bed for several days. Sputum was positive for *H. capsulatum.* One of the five was extremely sick for six weeks and suffered from a generalized disseminated histoplasmosis, however after recovery both the X-rays of his lungs and sputum were negative.

Exposure of animals and culture media was tried without good results, as the transportation of animals from Bogotá, to the cave — to Bogotá is difficult and the majority do not survive the trip, and the media was overgrown with air contaminants. However since all of the histoplasmin negative volunteers became positive after one exposure, it is obvious that the cave contains large quantities of *H. capsulatum* spores which can easily be inhaled.

Thus it seems that at least part of the tale is true, that of illness after entering. It is also quite possible that the cave holds many more interesting things, but in order to explore at greater length it is necessary to have oxygen masks, special lights and other equipment. However this is one of the most biologically interesting caves we have encountered to date in Colombia and certainly merits further study.

Bibliography

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