

Trophozoite Induced Infections of *Plasmodium falciparum* in *Saimiri sciureus* (Squirrel Monkeys)

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ABSTRACT: Unaltered *Saimiri sciureus* were susceptible to the trophozoite stages of chloroquine sensitive (Uganda-Palo Alto) and chloroquine resistant (Vietnam-Oak Knoll) strains of *Plasmodium falciparum*. The infections were serially transferred in these hosts.

High parasitemias, reaching more than 400,000 asexual parasites per cmm of the Uganda-Palo Alto strain, were sustained.

Gametocytemias were produced in 2 hosts but failed to infect 3 species of anophelines.

The monkeys adapted well to captivity and survived long periods following the infections.

The monkeys of Panama have failed generally to be good hosts for indigenous strains of *Plasmodium falciparum*. The Taliaferros (1934) reported only short periods of parasitemias in *Alouatta villosa* (black howler monkeys). Porter and Young (1967) were able to produce moderate infections of *P. falciparum* in *Saguinus geoffroyi* (the marmoset), which persisted for as long as 15 days, but serial passages were not achieved. Many other attempts in this laboratory to infect different species of Panamanian monkeys with parasitized human blood have not resulted in establishing infections which could be maintained serially.

Geiman and Meagher (1967), using an African strain of *falciparum* (Uganda-Palo Alto) directly from man, adapted this parasite to *Aotus trivirgatus* (night monkey) and established serial passages. Using this adapted strain, we found that it would grow well and could be passed serially in *Cebus capucinus* (the white-faced capuchin) (Young and Baerg 1969). Only transitory parasitemias were produced in *Ateles fusciceps* (the black spider monkey) and *A. villosa* (Baerg and Young 1970). Subsequently, a preliminary report indicated that this strain would grow in *Saimiri sciureus* (the squirrel monkey) (Young and Rossan 1969). The potential of *Saimiri* as a model for *P. falciparum* infections has been investigated further using the African strain (Uganda-Palo Alto) as well as a strain from

Vietnam (Vietnam-Oak Knoll). The results are presented in this report.

Material and Methods

Panamanian *Saimiri* monkeys used in this study were collected in the Chiriqui Province, Panama, from an area about 35 km east of the Costa Rican border. None of these animals were found to be harboring naturally acquired plasmodial infections.

Initially, the monkeys were housed in groups of 20 to 30 in out-door gang cages. After inoculation, the animals were moved into individual cages located in indoor laboratory rooms. As *Saimiri* monkeys are fastidious eaters, diverse foods were offered. The diet consisted of bananas, canned fruit cocktail, cottage cheese, raw peanuts, monkey chow (Wayne Monkey Diet) and a canned preparation (Science Diet®). This ration was supplemented occasionally with live, neonatal mice and weekly with a vitamin mixture (Octavitamin). Water was available ad libitum. The monkeys adjusted well to laboratory conditions.

All *Saimiri* were healthy adults and subadults, of either sex, and weighed approximately 300 to 500 gms. The monkeys initially were inoculated with the Uganda-Palo Alto strain of *P. falciparum* from *Aotus* bearing the 32nd and 33rd passages at Gorgas Memorial Laboratory (Young and Baerg 1969). Subsequent serial trophozoite transfers then were continued between *Saimiri*. The Vietnam-Oak Knoll strain, which had been adapted to *Aotus* monkeys, was provided kindly by Dr. W. Siddiqui of the University of Hawaii. *Saimiri*

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