

*Toxoplasma gondii* Nicolle & Manceaux in Dogs and Cats in Ceylon

by

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INTRODUCTION

Avirulent *Toxoplasma gondii* has been isolated in Ceylon from laboratory rats, rabbits and guineapigs and also from wild *Rattus rattus*, *Rattus norvegicus* and *Bandicota malabarica* (Kulasiri, 1962). The present study was undertaken to further our knowledge of the distribution of this parasite in other mammals.

MATERIALS AND METHODS

The dogs and cats examined for the presence of parasites were obtained from the Dog pound of the Colombo Municipal Council. All stray dogs and cats trapped within the Municipal Council area are brought to the dog pound and kept for three days before destroying them. The animals were gassed and decapitated at the dog pound and the heads were brought to the laboratory. The brains of the animals were dissected out as aseptically as possible into sterile petri dishes.

In the case of the dogs, samples of the brain equivalent to about 10 ml. were taken from different parts of the organ and pooled into a macerator containing about 20 ml. of saline. These were thoroughly macerated and 0.05 gms. of streptomycin were added and the suspension injected intraperitoneally into four mice. In the case of the cats, the whole brain was macerated with a similar quantity of saline and streptomycin and injected into four mice.

The inoculated mice were observed for one month at the end of which they were destroyed. The brains were dissected out, pooled and macerated with a little saline and examined for the presence of cysts of *Toxoplasma* under the low power of the microscope. If the brains were found negative, the diluted suspension with a little streptomycin, was inoculated into three mice. At the end of a month the mice were sacrificed and examined as before. If at this examination too the brains were found to be negative the original dog from which the specimens came was considered to have been free of *Toxoplasma*. If one or more mice of the first passage died before the end of one month, the brains of these were dissected out examined as before and injected into three mice. The peritoneal exudate of the dead mice was also examined microscopically wherever possible for the presence of the parasite.

## RESULTS

In all, 105 dogs were examined for the presence of *Toxoplasma*. Of these, five animals had to be discarded as the mice inoculated with their brains died, within a few days, of acute bacterial peritonitis. *Toxoplasma* was isolated from the brains of six dogs giving a rate of infection of 6%. Five of the strains of *Toxoplasma* isolated from the dogs were of the avirulent variety while the other was a virulent one. The five avirulent strains were isolated at the first mouse passage but the virulent strain was detected only in the second mouse passage. Of the mice inoculated with the brain of the dog from which the virulent strain was isolated, three died early of acute bacterial peritonitis and the last one died on the 28th. day after the infection. An examination of the peritoneal exudate of this animal could not be made as the abdominal viscera had decomposed. The brain when examined microscopically was negative for cysts and was passaged into fresh mice from which the virulent *Toxoplasma* was isolated. In subsequent passages the strain behaved like the RH strain.

Sixty four cats were examined for the presence of *Toxoplasma*. Of these, five animals had to be excluded as the mice inoculated with their brains died, within a few days, of acute bacterial peritonitis. From the remaining 59 animals *Toxoplasma* was isolated from 14 cats giving the rate of infection as 23.7%. All the isolated strains were of the avirulent variety. In one case, the *Toxoplasma* was isolated at the second passage of the brain of a mouse which had died earlier than the others. The rest when sacrificed and examined both microscopically and by mouse passage were found to be negative. This case is considered as positive as the strain should have originally come from the cat.

## DISCUSSION

Only two mouse passages were carried out on most of the material examined as previous experience had shown that most infections are revealed in the first mouse passage and rarely is it necessary to carry out the second passage. The present study has also supported this experience as most infections were detected in the first mouse passage. In the two cases where *Toxoplasma* was detected in the second passage, one was the virulent strain which does not form cysts in the brains of mice under these experimental conditions and hence could only be detected from the peritoneal fluid of the second passage mice. In the other case, the parasite was isolated from a mouse which died early. The second mouse passage is necessary only to detect such infections.

Reviews of the literature on the isolations of *Toxoplasma* from dogs and cats are given by Lainson (1956), Beverley (1957) and de Roever-Bonnet (1957). Most of the literature on the subject refers only to the isolation of the parasite from these hosts. Few workers have studied the relative prevalence of this parasite among these hosts. The rates of infection of the local dogs and cats compare well with the rates of infection reported from other countries. However, the recorded rates of infection for cats, whenever such records were made, (Eyles, Gibson, Coleman, Smith, Jumper & Jones, 1959; Gibson & Eyles, 1957; Jones, Eyles & Gibson, 1957) were very high. In our study also this was observed as compared to rates of isolation from other animals (Kulasiri, 1962). Since oral infection

has now been accepted as one of the possible modes of infection, a possible explanation is that cats have a greater chance of becoming infected as they feed on rats. The latter have been shown to be naturally infected with *Toxoplasma* practically all over the world. Jones, Eyles & Gibson (1957) found smaller cats less frequently infected than large mature cats. The larger cats being older would have a greater chance of acquiring an infection than smaller ones.

### SUMMARY

Both virulent and avirulent strains of *Toxoplasma gondii* have been isolated from dogs in Ceylon, the rate of infection being 6%.

Only avirulent *Toxoplasma* was isolated from cats. The rate of infection was 23.7%. The significance of the high rate of infection in the cats is discussed.

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