Assessing Toxoplasma gondii Exposure in Bats: A Comparison of Blood Collection Methods

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The interaction between parasites and hosts results from an evolutionary balance but can be affected by environmental changes. In Bahia, significant deforestation may influence the spread of zoonotic agents. Toxoplasmosis, caused by Toxoplasma gondii, affects various species, but the presence of antibodies in bats remains understudied. This study aimed to assess the frequency of anti-T. gondii antibodies in bats from Bahia and compare the efficiency of whole blood and filter paper blood collection for immunological testing. Bats were captured in enclosed environments and using mist nets. Blood was collected via intracardiac or venous puncture, with part of the samples deposited on filter paper. Liver samples were obtained from euthanized animals. Serological tests were performed using direct agglutination, and statistical analyses were conducted in EpiInfo 7 and DagStat, including chi-square tests, McNemar's test, and the Kappa coefficient. A total of 45 bats from different municipalities and habitats were analyzed. Nine animals (20%) tested positive for T. gondii antibodies, with seven positive in both whole blood and filter paper samples and one in the liver. Diagnostic analysis showed high specificity (92.31%) for filter paper but moderate sensitivity (60%), indicating a high number of false negatives. The Kappa coefficient (0.5231) indicated moderate agreement between matrices, and statistical analysis confirmed a significant association between results ($p = 0.0036$). Whole blood and filter paper tests demonstrated good specificity and negative predictive value, but the reduced sensitivity of filter paper limits its clinical applicability. Although it is a viable alternative, whole blood remains the most reliable matrix for detecting T. gondii antibodies in bats.

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