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CHAPTER 7

AVIAN HEMATOZOA IN SOUTH AMERICA: A COMPARISON OF TEMPERATE AND TROPICAL ZONES

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Abstract.—We used screening techniques based on polymerase chain reaction (PCR) to explore the avian hematozoan parasites (*Plasmodium* spp. and *Haemoproteus* spp.) of two previously uninvestigated regions of continental South America. Comparisons of tropical-zone Guyana and temperate-zone Uruguay revealed that overall prevalence of *Plasmodium* and *Haemoproteus* species detected in a diverse sampling of potential hosts was significantly higher in Guyana. The difference in prevalence between the two geographic zones appears to be attributable to ecological differences rather than taxonomic sampling artifacts. Diversity of hematozoan haplotypes was also higher in Guyana. We found no relationship between hematozoan haplotype and host family sampled within or between regions. We found very few *Plasmodium* and no *Haemoproteus* haplotypes shared between the two regions, and evidence of geographic structuring of hematozoan haplotypes between the two regions. We suggest that a lack of hematozoan haplotype transmission between the two regions may be attributable to the migratory patterns of each region's avian hosts. *Received 11 April 2005, accepted 21 November 2005.*

Resumen.—Usamos técnicas de investigación basadas en reacción en cadena de polímeros (RCP) para explorar hemoparásitos avícolas (*Plasmodium* spp. y *Haemoproteus* spp.) en dos regiones no investigadas de Sudamérica. Las comparaciones de la zona tropical de Guyana y de la zona templada de Uruguay revelaron que la frecuencia general de especies de *Plasmodium* y *Haemoproteus* encontrados en una muestra diversa de hospederos potenciales fue significativamente más alta en Guyana. La diferencia en frecuencia entre las dos zonas geográficas aparentemente se debe a diferencias ecológicas que debido al muestreo taxonómico. La diversidad de hematozoos haplotípicos fue también más alta en Guyana. No encontramos una relación entre hematozoos haplotípicos y familias de hospederos muestreados dentro o entre las regiones. Encontramos solo algunos cuantos haplotipos de *Plasmodium* en común entre las dos regiones, pero no se encontraron haplotipos de *Haemoproteus*, ni evidencia de una estructuración geográfica de haplotipos de hematozoos entre las dos regiones. Por lo que sugerimos que la ausencia de transmisión de haplotipos de hematozoos entre las dos regiones puede ser atribuida a los patrones de emigración, para cada región, de las aves hospederas.

Hematozoan parasites (*Plasmodium* spp. and *Haemoproteus* spp.) are commonly found in blood smears from birds on every continent except Antarctica (Bennett et al. 1993). Hematozoan prevalence may differ between geographic locations, and climate may play an important role in this difference by influencing the density of vectors or potential hosts or the ease of transmission. Comparison of hematozoan parasites of temperate and tropical zones may reveal differences related to climatic factors. For example, Ricklefs (1992), surveying results from analyses based on blood smears, found a 2.6× greater infection rate in temperate than in tropical zones. Temperate and tropical

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