

Swamp fever in wild horses from the Pantanal, Brazil

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Key words

Horse - Wild animal - Equine infectious anemia - Pantanal - Brazil.

Summary

The Pantanal is a large wetland with an area of 140,000 km², located in the center of South America. In the Pantanal some very large ranches (usually over 40,000 ha) have populations of wild horses. The objective of this study was to evaluate the occurrence of equine infectious anemia (EIA) in a population of wild horses in an EIA-endemic region. In this study seropositivity to EIA was 5.6% in wild horses and 34.1% in domestic horses belonging to the same ranch. The observed prevalence rates were 5.7% in wild male horses and 5.3% in wild females. The observed prevalence rate in domestic male horses was 34.1%. Mean ages of domestic seropositive and domestic seronegative horses were 9 and 5.8 years old, respectively. Mean ages of wild seropositive and wild seronegative horses were 3.2 and 1.7 years old, respectively. No sex influence was observed in the wild animals. There was a very significant ($P < 0.001$) difference between the EIA prevalence in wild and domesticated horses in the studied farm. The hypothesis formulated by the authors is that man had played an important role in the EIA virus transmission to domesticated horses in the Pantanal. On the other hand, in wild populations insect vectors probably played a fundamental role in EIA transmission in the region.

INTRODUCTION

The Pantanal is a large wetland with an area of 140,000 km², ranging in altitude from 80 to 130 m above sea level, located in the center of South America, between 16 and 21°S, and 55 and 58°W (figure 1). Extensive cattle farms of 10,000 to 200,000 hectares occupy the majority of this floodplain. Feral pigs excepted, studies of diseases in domestic animals that turned to a feral state are very rare. Free-ranging populations of horses can be found in the Americas and Australia. These wild horses are feral animals whose ancestors were once domesticated. The process of feralization is straightforward; it merely involves an animal fending for itself. Wild horses once lived in South America where they were abundant on the Falkland Islands as well as in Argentina, Brazil, Chile, Peru, and Venezuela (2). In the Pantanal, some very large ranches, with areas usually over 40,000 ha, have populations of wild horses. Equine infectious anemia (EIA) is worldwide known

as swamp fever and is caused by a retrovirus belonging to the lentivirus subfamily that infects members of the Equidae family. EIA causes a persistent infection in horses resulting in periodic episodes of fever, anemia, thrombocytopenia, leukopenia and weight loss. Transmission can be vertical or horizontal by contaminated needles, mothers' milk and fly bites (5). Blood from persistently infected horses is the major source of EIA virus (EIAV) transmission occurring mechanically either because of man or blood-feeding vectors. The majority of horses infected with the EIA virus did not appear to demonstrate any of the clinical abnormalities listed above, as observed by Foil and Issel (4). EIA prevalence is higher in regions with long vector seasons. In the United States, EIAV infections are commonly observed in the states bordering the Gulf of Mexico, presumably because the semitropical environment favors a long season for blood-feeding vectors that mechanically transmit the EIA virus (4). The aim of this study was to evaluate in an endemic region the occurrence of EIA in a horse population that had no contact with men.

MATERIALS AND METHODS

The study was carried out on a 45,000 ha ranch with a herd of about 700 horses, of which 252 only were domesticated. All domesticated and 268 wild horses (268/448) were sampled. The horses were bled from the jugular vein using a vacuum system (Vacuum II, Labnew, Campinas, SP, Brazil). The diagnosis was

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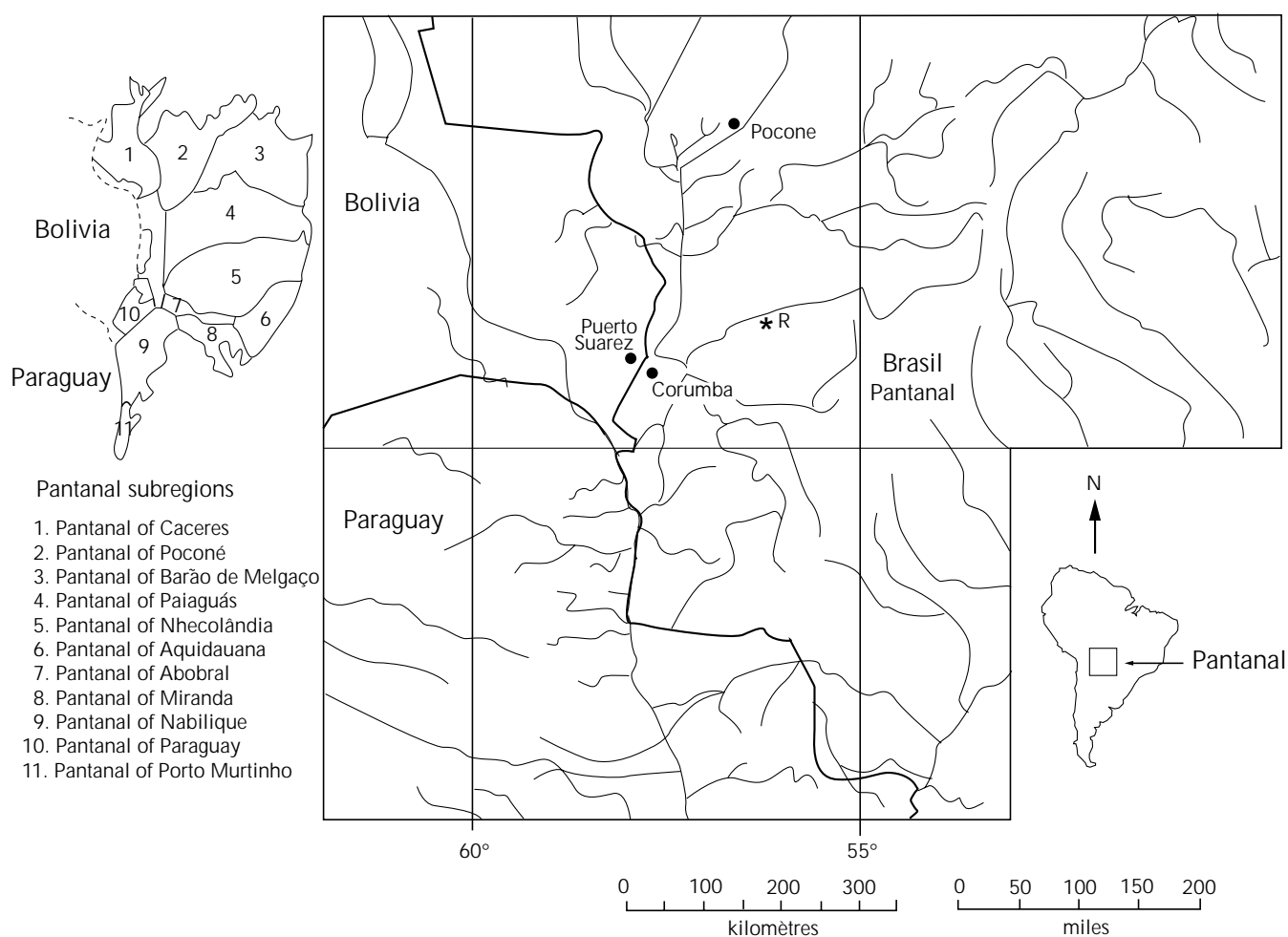


Figure 1: Study area. Location of the Pantanal, its subregions and the sampled ranch (R).

made using agar gel immunodiffusion test (D-Tec AIE, Pitman Moore, São Paulo, SP, Brazil). A binary analysis (0 or 1) indicating the occurrence or not of the disease in each animal was performed with the following factors: coat color, age, sex, and class.

■ RESULTS

In the ranch where the study on EIA in wild horses was carried out seropositivity rates in domesticated and wild horses were 34.1 and 5.6%, respectively. In domesticated males (in this farm only males were domesticated) the observed prevalence rate was 34.1%; The mean ages of seronegative and seropositive horses were 5.8 and 9 years old, respectively. In wild horses the observed prevalence rate was 5.7% in males and 5.3% in females; The mean ages of seronegative and seropositive horses were 1.7 and 3.2 years old, respectively. In wild horses no influence of sex or coat color was observed ($P < 0.05$). There was a very significant difference ($P < 0.001$) regarding the prevalence and age of seropositive wild horses compared to those of domesticated horses.

■ DISCUSSION

According to Issel *et al.*, although man has undoubtedly played an important role in EIAV transmission, the majority of today's EIA new cases in most developed countries are thought to result from the mechanical transfer of EIAV-infected blood to uninfected horses by hematophagous insects (5). According to Pearson and

Knowles, the larger percentage of EIA positive tests in the southern and eastern United States may be due to the prevalence of insect vectors in these regions (7). Tabanids (horseflies, deerflies, clegs) are large telmophagous insects that inflict painful bites and are strong fliers (3). They have been associated with the transmission of over 35 pathogenic agents (6). Barros identified 25 Tabanidae species belonging to 15 genera and three subfamilies in the Pantanal (1). The same author studying the ecology of tabanids in the region observed that the vector season occurs in the first half of the rainy season, from September/October to December/January. However, the tabanids still remain in high numbers until the end of the rainy season. This season could represent the period of major risk of EIA and other blood-transmitted diseases by these insects because they are in abundance and there is a population peak of species with high vector potential, notably *Tabanus importunus* (8).

■ CONCLUSION

There was a significant difference between EIA prevalence in wild and domesticated horses on the farm. The hypothesis formulated by the authors is that man played an important role in the EIA virus transmission to domesticated horses by injection (direct role) or by increasing the concentration (density) of domesticated horses, thus, furthering the transmission by arthropods. On the other hand, a lesser density associated with wild horses may explain the discrepancy in the results.

Acknowledgments

We wish to thank Mrs. Idete Herman for the figure. This research project was supported by EMBRAPA (Empresa Brasileira de Pesquisa Agropecuária), project No. 06.094.623/02, and CECITEC (Conselho Estadual de Ciência e Tecnologia do Estado de Mato Grosso do Sul), project No. 50-10012-009-92.

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Reçu le 19.2.99, accepté le 21.7.99

Résumé

Silva R.A.M.S., Abreu U.G.P., Dávila A.M.R., Ramirez L. Anémie infectieuse équine chez des chevaux sauvages au Pantanal, Brésil

Le Pantanal est une grande étendue marécageuse, d'une superficie de 140 000 km² et situé au centre de l'Amérique du Sud. Au Pantanal, quelques très grandes propriétés (en général de plus de 40 000 ha) hébergent des populations de chevaux sauvages. Le but de cette étude a été d'évaluer la présence de l'anémie infectieuse équine (AIE) chez une population de chevaux sauvages dans une région d'enzootie de l'AIE. Dans cette étude, la séropositivité pour l'AIE a été de 5,6 p. 100 chez les chevaux sauvages, et de 34,1 p. 100 chez les chevaux domestiques appartenant tous à la même propriété. Les taux de prévalence observés chez les chevaux mâles sauvages ont été de 5,7 p. 100 contre 5,3 p. 100 chez les femelles sauvages. Le taux de prévalence observé chez les chevaux mâles domestiques a été de 34,1 p. 100. L'âge moyen des chevaux domestiques séropositifs a été de 9 ans, alors que celui des chevaux domestiques séronégatifs a été de 5,8 ans. L'âge moyen des chevaux sauvages séropositifs a été de 3,2 ans, mais celui des chevaux sauvages séronégatifs a été de 1,7 an. L'influence du sexe n'a pas été observée chez les animaux sauvages. Il y a eu une différence très significative ($P < 0,001$) entre la prévalence de l'AIE chez les chevaux domestiques et chez les chevaux sauvages dans la propriété étudiée. Les auteurs émettent l'hypothèse que l'homme a été un acteur important dans la transmission du virus de l'AIE aux chevaux domestiques au Pantanal. Cependant, les insectes vecteurs ont probablement joué un rôle fondamental dans la transmission de l'AIE aux populations de chevaux sauvages dans cette région.

Mots-clés : Cheval - Animal sauvage - Anémie infectieuse du cheval - Pantanal - Brésil.

Resumen

Silva R.A.M.S., Abreu U.G.P., Dávila A.M.R., Ramirez L. La fiebre del pantano en caballos salvajes en el Pantanal, Brasil

El Pantanal es una gran zona húmeda de 140 000 km², localizada en el centro de Sur América. En Pantanal, algunos ranchos enormes (usualmente de más de 40 000 ha) tienen poblaciones de caballos salvajes. El objetivo de este estudio fue el de evaluar la incidencia de la anemia infecciosa equina (AIE) en una población de caballos salvajes, en una región endémica de AIE. En el presente estudio, la seropositividad para AIE fue 5,6% en los caballos salvajes y 34,1% en los caballos domésticos del mismo rancho. Las prevalencias observadas fueron de 5,7% en caballos salvajes y de 5,3% en yeguas salvajes. La prevalencia observada en machos domésticos fue de 34,1%. La edad media de los caballos domésticos seropositivos y seronegativos fue de 9 y 5,8 años respectivamente. La edad media de los caballos salvajes seropositivos y seronegativos fue de 3,2 y 1,7 años respectivamente. No se observó influencia del sexo en los animales salvajes. En la finca del estudio, se encontró una diferencia muy significativa ($P < 0,001$) en la prevalencia de AIE entre caballos salvajes y domésticos. Los autores sugieren la hipótesis de que el hombre debe haber jugado un papel importante en la transmisión del virus de AIE a los caballos domésticos en Pantanal. Por otro lado, en las poblaciones salvajes los insectos vectores han jugado, probablemente, un papel fundamental en la transmisión en la región.

Palabras clave: Caballo - Animal salvaje - Anemia infecciosa equina - Pantanal - Brasil.