

## An Update in Helminth Fauna and Other Equine Parasites in Cuba

### Review article

Karel Gómez-Cabrera\*; Josmel Salas-Romero\*; Zaúl Gutiérrez Lastra\*; José Barreto\*; Mara L. Gutiérrez\*; Liliana Sorís\*; Amílcar Arenal\*\*

\*Department of Veterinary Medicine, Faculty of Agricultural Sciences, Ignacio Agramonte Loynaz University of Camagüey, Cuba

\*\* Department of Morphophysiology, Faculty of Agricultural Sciences, Ignacio Agramonte Loynaz University of Camagüey

[josmel.salas@reduc.edu.cu](mailto:josmel.salas@reduc.edu.cu)

---

#### ABSTRACT

Understanding of parasitic diseases begins by knowing the species of a population. Accordingly, information to identify the equine helminth faunas of Cuba was re-collected due to the gradual loss of data caused by deterioration of the printed scientific literature. These parasitic populations were first identified by Doctor Idelfonso Pérez Viguera during the first half of the 21<sup>st</sup> Century. Further studies were conducted on horse populations in different provinces. Currently, 34 helminths have been properly reported, including nine benzimidazole-resistant species of cyathostomes in several herds. As a result of a large number of nematodes described in the international scientific literature, and due to the insufficient studies made in Cuba, the equine helminth faunas probably include a larger number of species. Hence, further comprehensive studies should be conducted on this topic.

**Key words:** *equines, helminths, parasites*

#### INTRODUCTION

Over millions of years, equidae evolved as hosts of various forms of parasitic forms, so they may be considered a normal part of the fauna that inhabits their intestines (Nielsen, 2012). However, the living conditions established and the selection practices set by man have favored higher exposure and susceptibility to diseases (Duarte *et al.*, 2014).

Today, gastrointestinal parasitism is one of the most commonly seen disorders that affect equines worldwide (Nielsen, 2015). Some of these disorders are growth retardation, weight reduction, diarrhea, colics, reduced physical capacity for work and sports, and even death (Thamsborg *et al.*, 1998; Stancampiano *et al.*, 2017; Aromaa *et al.*, 2018).

The animals which are not treated with anthelmintic drugs after feeding in contaminated areas may accumulate large quantities of parasites (Matthews, 2014). Gastrointestinal nematodes that affect equines are comprised in 7 sub-orders, 12 families, 29 genera, and 83 species, of which 63 species belong to the *Strongylidae* family, that includes some of the most pathogenic horse parasites (Lichtenfels *et al.*, 2008).

In Cuba, little research has been done to identify the epidemiology of nematodes affecting equines (Salas-Romero *et al.*, 2014a). Just four studies have dealt with morphometric identification of equine parasites in Cuba; other studies have focused on ooscopic and larvoscopic diagnostics. The two largest classification studies (Pérez-Viguera, 1936; and Varus and Valle, 1966) are only available in a limited number of printed copies. Therefore, information regarding equine parasites reported so far in Cuba should be compiled.

#### DEVELOPMENT

The first identification study of parasite fauna in horses was conducted by doctor, (Pérez-Viguera, 1936) in Havana. It consisted in the observation of 15 species of parasites, including 14 kinds of nematodes: *Strongylus equinus* (Müller, 1780); *Strongylus edentatus* (Looss, 1900); *Strongylus vulgaris* (Looss, 1900); *Triodontophorus tenuicollis* (Boulenger, 1916); *Oesophagodontus robustus* (Giles, 1892); *Cyathostomum tetracanthum* (Mehlis, 1831) synonym used: *Trichonema tetracanthum*; *Cyathostomum pat-*

*eratum* (Yorke and Macfie, 1919) synonym used: *Trichonema pateratum*; *Cylicostephanus longibursatus* (Yorke and Macfie, 1918) synonym used: *Trichonema longibursatum*; *Oxyuris equi* (Schrank 1788); *Parascaris equorum* (Goeze 1782); *Habronema muscae* (Carter 1861); *Habronema megastoma* (Rudolphi, 1819); *Habronema microstoma* (Schneider, 1866); *Setaria equina* (Abildgaard, 1789), and a cestode: *Anoplocephala perfoliata* (Goeze 1782).

Later, Varus and Valle (1966) continued the work done by Pérez-Vigueras (1936), based on thorough helminthological necropsy of four equines in the former province of Oriente. In that study, 26 intestinal worm species (25 nematodes and a cestode) were observed. Among them, 17 species of nematodes were reported for the first time in Cuba. *Triodontophorus serratus* (Looss, 1900); *Triodontophorus brevicauda* (Boulenger, 1916); *Triodontophorus nipponicus* (Yamaguti, 1943); *Cylicostephanus calicatus* (Looss, 1900) synonym used: *Trichonema calicatum*; *Cyathostomum catinatum* (Looss, 1900) synonym used *Trichonema catinatum*; *Coronocylus coronatus* (Looss, 1900) synonym used *Trichonema coronatum*; *Cylicocylus insigne* (Boulenger, 1917); *Cylicocylus nassatus* (Looss, 1900); *Cylicodontophorus bicoronatus* (Looss, 1900) synonym used *Cylicodontophorus bicoronatum*; *Parapoteriostomum euproctus* (Boulenger, 1917) synonym used *Cylicodontophorus euproctus*; *Coronocylus sagittatus* (Kotlán, 1920) synonym used *Cylicodontophorus sagittatus*; *Cylicostephanus goldi* (Boulenger, 1917) synonym used *Schulzitriconema goldi*; *Cylicostephanus hybridus* (Kotlán, 1920) synonym used *Schulzitriconema hybridum*; *Coronocylus labiatus* (Looss, 1902) synonym used *Schulzitriconema labiatum*; *Coronocylus labratus* (Looss, 1900) synonym used *Schulzitriconema labratum*, and *Gyalcephalus capitatus* (Looss, 1900).

In 1977, Prieto and Orta (1977) observed two new cestode species in Cuba, after necropsy practiced to 35 equines in Havana, Camagüey, and Oriente: *Anoplocephala magna* and *Paranoplocephala mamillana*. Accordingly, the three species of equine cestodes were reported. Then, a helminthological necropsy revealed a 87.5% prevalence of *A. perfoliata* in 16 equines in Villa Clara province, with an invasive intensity of 80-450 parasites per animal (Hernández and Brito, 2011).

More recently, research done by the parasitology team at the University of Camagüey showed the presence of nematode *Cylicostephanus minutus* (deposited in CZACC No. 11.7044), in Turiguano Ranch, Ciego de Avila province (Salas-Romero *et al.*, 2017a), and in carriage horses in the city of Camagüey, which were collected *in vivo* from the feces of equines after anti-parasitic treatment. In addition, gender *Poteriostomum* was detected through larvoscopy analysis in herds of several provinces of Cuba (Salas-Romero *et al.*, 2014b; Salas-Romero *et al.*, 2017b; Salas-Romero *et al.*, 2018).

According to Salas-Romero (2018), to present, at least nine of the cyathostome species have developed benzimidazole resistance in various equine herds in Cuba, namely species *Cylicocylus nassatus* (Looss, 1900), *Cylicostephanus longibursatus* (Yorke and Macfie, 1918), *Cyathostomum catinatum* (Looss, 1900), *Cyathostomum pateratum* (Yorke and Macfie, 1919), *Cylicostephanus goldi* (Boulenger, 1917), *Coronocylus coronatus* (Looss, 1900), *Cylicostephanus minutus* (Yorke and Macfie, 1918), *Coronocylus labiatus* (Looss, 1902), *Cylicostephanus calicatus* (Looss, 1900), and *Habronema muscae* (Carter, 1865). In turn, species *Cylicocylus nassatus*, *Cylicostephanus longibursatus*, and *Cyathostomum catinatum* showed higher prevalence. Moreover, the three species totaled more than 90% of the nematodes identified from over 80% of the herds studied (Salas-Romero, 2018).

Other non-helminth parasites are frequently observed in Cuban equines. Among equidae blood protozooses, species *Babesia caballi* and *Theileria equi* have been reported (Espaine and Lines, 1996), with 25 and 73% prevalence, respectively, and 20% concomitant infections (Díaz-Sánchez *et al.*, 2018).

Among the arthropods, various species of Ixodides were previously reported (Espaine and Lines, 1996). *Dermacentor nitens* and *Amblyoma cajennense* were commonly observed by the authors of this paper under the Cuban conditions, though *Rhipicephalus (Boophilus) microplus* can also be observed to parasitize equidae. The impact of tick infestations on equines is considerable in herds in San Vicente (Jimaguayú, Camagüey), for instance, where large infestations of young animals caused necrosis in extensive areas of

the skin, and even the death of offspring (data not published by the authors), adding to their roles as vectors.

So far, species *Gastrophilus nasalis* and *G. intestinalis* have been reported in Cuba (Espaine and Lines, 1996). Gastrophyllosis is one instance of necropsy in horses with colics found at Turiguano Ranch, causing several deaths in the area. In Camagüey, it has been observed *in vivo*, in feces, after treatment with Ivermectin (data not published by the authors).

## CONCLUSIONS

Due to the large number of nematode species described in the literature in recent years, and the few studies conducted in Cuba, the equine helminth fauna on the island is very likely to be composed of a greater number of species than the ones reported in this paper. Accordingly, further comprehensive studies should be done in order to customize programs to confront and control nematodes in equines.

## REFERENCES

- Aromaa, M.; Hautala, K.; Oksanen, A.; Sukura, A. y Näreaho, A. (2018). Parasite Infections and their Risk Factors in Foals and Young Horses in Finland. *Veterinary Parasitology: Regional Studies and Reports*, 12, 35-38.
- Díaz-Sánchez, A. A.; Pires, M. S.; Estrada, C. Y.; Cañizares, E. V.; del Castillo Domínguez, S. L.; Cabezas-Cruz, A. et al. (2018). First Molecular Evidence of *Babesia caballi* and *Theileria equi* Infections in Horses in Cuba. *Parasitology research*, 117(10), 3109-3118.
- Duarte, P. C.; Hill, A. E. y Morley, P. S. (2014). Epidemiology of Equine Infectious Disease. En D. C. Sellon y M. T. Long (Eds.), *Equine Infectious Diseases* (Second Edition, Chapter 61, pp. 515-529.e512). St. Louis: W.B. Saunders.
- Espaine, L. y Lines, R. (1996). *Manual de Parasitología y Enfermedades Parasitarias* (Vol. II). La Habana, Cuba: Ed. Félix Varela.
- Hernández, M. y Brito, H. (2011). Intensidad y extensión de *Anoplocephala perfoliata* en una empresa ganadera. *Revista de Producción Animal*, 23(1), 39-40.
- Lichtenfels, J. R.; Kharchenko, V. A. y Dvojnjos, G. M. (2008). Illustrated Identification Keys to Strongylid Parasites (Strongylidae: Nematoda) of horses, zebras and asses (Equidae). *Vet Parasitol*, 156(1-2), 4-161.
- Matthews, J. B. (2014). Anthelmintic Resistance in Equine Nematodes. *International Journal for Parasitology: Drugs and Drug Resistance*, 4(3), 310-315.
- Nielsen, M. K. (2012). Sustainable equine parasite control: perspectives and research needs. *Veterinary Parasitology*, 185(1), 32-44.
- Nielsen, M. K. (2015). Internal Parasite Screening and Control. In K. A. Robinson & S. Edward (Eds.), *Robinson's Current Therapy in Equine Medicine (Seventh Edition)* (pp. 336-340). St. Louis: W.B. Saunders.
- Pérez-Vigueras, I. (1936). Notas sobre la fauna parasitológica de Cuba *Memorias de la Sociedad Cubana de Historia Natural* (Vol. 10): Universidad de la Habana.
- Prieto, R., & Orta, T. (1977). Dos nuevos Cestodos para la fauna helmintológica de los equinos de Cuba. *Poeyana*(167), 1-6.
- Salas-Romero, J. (2018). *Resistencia de los ciatostomas a los benzimidazoles en equinos de Cuba*. (PhD Thesis), Agricultural University of Havana, Cuba.
- Salas-Romero, J., Batista, B., Villavicencio, L., Mencho, J. D., & Llorens, Y. G. (2014a). Prevalencia de nematodos gastrointestinales en la unidad equina Las criollas Rancho La Belén. *Revista de Producción Animal*, 26(3), 30-35.
- Salas-Romero, J., Gomez-Cabrera, K., Chicoy, Y., Yero, J. C., Valle, E., Salas, J. E., & Arenal, A. (2017a). Especies de Ciatostomas Resistentes al Albendazol en Equinos, Cuba. *Rev Inv Vet Perú*, 28.

## An Update in Helminth Fauna and Other Equine Parasites in Cuba

- Salas-Romero, J., Gómez-Cabrera, K. A., Aguilera-Valle, L. A., Bertot, J. A., Salas, J. E., Arenal, A., & Nielsen, M. K. (2017b). Helminth egg excretion in horses kept under tropical conditions—Prevalence, distribution and risk factors. *Veterinary Parasitology*, *243*, 256–259.
- Salas-Romero, J., Gómez-Cabrera, K. A., Salas, J. E., Vázquez, R., Arenal, A., & Nielsen, M. K. (2018). First report of anthelmintic resistance of equine cyathostomins in Cuba. *Veterinary Parasitology: Regional Studies and Reports*, *13*, 220-223.
- Salas-Romero, J., Mencho, J. D., Guerra, Y., & Mencho, J. C. (2014b). Prevalencia de nematodos intestinales y eficacia de Labiomec® en caballos de Camagüey, Cuba. *Revista de Salud Animal*, *36*(3), 152-158.
- Stancampiano, L., Usai, F., Marigo, A., & Rinnovati, R. (2017). Are small strongyles (Cyathostominae) involved in horse colic occurrence? *Veterinary Parasitology*, *247*, 33-36.
- Thamsborg, S. M., Leifsson, P. S., Grondahl, C., Larsen, M., & Nansen, P. (1998). Impact of mixed strongyle infections in foals after one month on pasture. *Equine Vet J*, *30*(3), 240-245.
- Varus, V., & Valle, M. T. (1966). Nuevos registros de nematodos que parasitan en caballos (*Equus caballus* Linné) de Cuba. *Poeyana, serie A* (27), 1-10.

Received: 2-12-19

Accepted: 3-1-19