

# Strongyle Infections in Horses from North Vietnam

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## Key words

Equidae - Draught horse - Working animal - *Cyathostoma* - *Strongylus* - Vietnam.

## Summary

This study based on fecal egg counts and fecal cultures showed that strongyle infections were a major health constraint in adult horses in North Vietnam. In packhorses from mountainous areas, the mean fecal egg count was 2053 eggs per gram (EPG), while in carriage-horses of the Red River delta it was 732. *Cyathostoma* spp. were found to be the most abundant in all fecal cultures, whereas *Strongylus* spp. prevalence was less than 7%. It appeared that 63% of all the animals were eligible for treatment since they had egg counts higher than 500 EPG. Further research on the epidemiology of strongyle infections in horses in North Vietnam is needed before recommendations can be made on a treatment program.

## INTRODUCTION

Horses are neglected in animal science in Vietnam. Although their number is not as high as that of other livestock species, it exceeds 150,000 head. Moreover, individual horses have values at least twice those of cattle or water buffaloes. They are used as pack animals in the mountainous areas and as carriage animals in the paddy fields of the plains.

Various potentially pathogenic gastrointestinal (GI) parasites have been described in Vietnam: *Parascaris equorum*, *Strongylus edentatus*, *S. equinus*, *Strongyloides westeri*, and a range of *Cyathostoma* spp. (3, 4). However, comprehensive epidemiological

data on the prevalence and intensity of infections of these parasites in horses in Vietnam are absent. It can be expected that transmission and infection rates of GI parasites are high in Vietnam since (i) grazing is intensive because of the grazing land shortage, (ii) the wet mild climate is conducive to year-round development and survival of preparasitic stages on pasture, and (iii) the use of anthelmintics in horses is very limited.

The study was based on fecal egg counts and fecal cultures performed in two geographical areas, the Red River delta and a mountainous area of North Vietnam. Results on the prevalence and intensity of strongyle infections in adult horses are presented.

## MATERIALS AND METHODS

In August 2000, at the end of the hot wet season, two districts in Bac Can province, a mountainous area north of Hanoi, and two districts in Bac Giang province, located at the periphery of the Red River delta, were visited. In both areas the main agricultural activities were cultivation of rice and maize and, to a lesser extent, livestock production. In Bac Can, horses were used to carry goods such as fuel, feed and agriculture products to and from villages with no road access. There was no breeding program and all

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animals, mainly stallions, were purchased at 3-4 years of age from neighboring districts. In Bac Giang, animals of either sex were used as carriage-horses, while on rare occasions horses were also used as draught animals for rice cultivation. In both provinces horses were kept according to the traditional grazing system with limited grazing (2-4 h) on communal land in and around the village, and they were partially fed cut-and-carry grass, rice straw, maize stubs, etc. In addition, horses in the mountainous area also had the opportunity to browse on non-cultivated shrubs. The mean annual temperature in the delta area is 21.5°C with on average 16.4°C in January and 28.9°C in July. No accurate data on the Bac Can province were available, but average temperatures were 2-3°C lower than those in the lowland. Rainfall in the delta is on average 1500-1600 mm per year with the highest rainfall in June-September (300 mm per month) and the lowest in December-March (less than 40 mm per month). In Bac Can province total precipitation is slightly higher (1800-1900 mm per year). Grass growth in both areas is year round.

During the visits rectal fecal samples of 247 horses were collected and information on the use of anthelmintics was obtained from the owners. The horses were randomly selected in the small villages that were visited with the help of the district veterinary officer. In Bac Giang 154 horses of both sexes, 2 to 20 years old (median: 8 years old) were sampled. In Bac Can 93 horses were sampled; all were males, except for two, and were 2 to 30 years old (median: 8 years old). Most owners had one or two horses.

Individual nematode egg counts were carried out by a modified McMaster technique with a saturated NaCl solution (7). Each egg counted was equivalent to 50 eggs per gram (EPG) feces. Fecal samples were pooled according to EPG levels: < 500 (low), 500-2000 (moderate), 2000-3500 (high), > 3500 (very high); 200 third stage larvae were identified from each culture (6).

## ■ RESULTS

In both Bac Giang and Bac Can provinces anthelmintic treatments were never given to the horses.

Results of fecal egg counts were subdivided by province. In Bac Can, strongyle eggs were found in all 93 samples, with a mean of 2053 EPG, a maximum of 11,300 EPG and a median of 1,450 EPG. EPGs were higher than 1000 and 500 in 62 and 79% of the samples, respectively. In Bac Giang 137 (89%) of the 154 fecal samples collected contained strongyle eggs, with a mean of 732 EPG, a maximum of 2950 EPG and a median of 650 EPG. EPGs were higher than 1000 and 500 in 29 and 54% of the samples, respectively. From the fecal cultures, various types of larvae were identified: *Cyathostoma* spp., *Triodontophorus* spp., *Strongylus equinus*, *S. vulgaris*, *S. edentatus*, and *Trichostrongylus axei*. No major differences were found between provinces and/or fecal egg count groups. *Cyathostoma* spp. were the most abundant in all cultures (85%), while prevalence of *Strongylus* spp. was less than 7% (that of *S. vulgaris* was the highest).

## ■ DISCUSSION

Although equine strongylosis is well documented in cooler climates, little information is available from tropical countries (1), even though it can be expected that, at least for cyathostomes, most species present in the tropics are similar to those in temperate regions (2). Since all samples were collected during the same period no conclusions could be drawn on seasonal variations.

Over 94% of the animals passed strongyle eggs; this was similar to reports from other regions (5). Although caution should be applied when estimating actual worm burdens from EPG levels, it is commonly agreed that an individual horse with an egg count over 500 EPG is eligible for treatment, which would concern more than 63% of all animals in this study (8). The high fecal egg counts could be explained by the climatic conditions of North Vietnam that are conducive to development, survival and transmission of preparasitic stages on pasture during most of the year, and by the absence of anthelmintic treatments.

Data showed differences in infection levels between the two provinces. This was surprising as there was considerably more grazing activity in Bac Giang than in the mountainous province of Bac Can, where a notable amount of the diet came from the extensively grazed forest. Packhorses in the mountainous province of Bac Can might have become infected when they grazed for short periods at the common resting places along the mountain tracks. These pastures might have become heavily contaminated with infective larvae.

This study showed that moderate to high strongyle infections were common in horses in the surveyed North Vietnam provinces. No anthelmintic treatments were administered to horses, but a local practice, where feces used as fertilizer were collected on the pastures by hand, was likely to reduce, to a certain extent, pasture contamination. Based on this study, an anthelmintic treatment might be indicated for over 63% of the horse population. However, further epidemiological research is needed before recommendations for a treatment program can be made.

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## REFERENCES

1. COURTNEY C.H., 1999. Seasonal transmission of equine cyathostomes in warm climates. *Vet. Parasitol.*, **85**: 173-180.
2. CRAIG T.M., 1999. Considerations for the control of equine cyathostomes in arid areas. *Vet. Parasitol.*, **85**: 181-188.
3. DAO HUU THANH, LE SINH NGAN, NGUYEN VAN CHONG, 1978. Investigation on prevalence of gastrointestinal parasites in horses from Ra Van farm. *Khoa Hoc Ky Thuat Y*, **291**: 314-321.
4. LAN P.D., LANG P.S., PHUC D.V., 1996. Nematodes and nematodic disease of domestic animals in Vietnam. (Benh giun tron cua vat nuoi o Viet Nam). Hanoi, Vietnam, Agriculture Press, 212 p.
5. LYONS E.T., TOLLIVER S.C., DRUDGE J.H., 1999. Historical perspectives of cyathostomes; prevalence treatment and control programs. *Vet. Parasitol.*, **85**: 97-112.
6. MANUAL OF VETERINARY PARASITOLOGICAL LABORATORY TECHNIQUES, 1986. London, UK, Ministry of Agriculture, Fisheries and Food, 159 p.
7. THIENPONT D., ROCHETTE F., VANPARIJS O.F.J., 1986. Diagnosing helminthiasis by coprological examination. Beerse, Belgium, Janssen Research Foundation, 187 p.
8. UHLINGER C., 1993. Uses of fecal egg count data in equine practice. *The Compendium*, **15**: 742-749.

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## Résumé

**Holland W.G., Geurden T., Do T.T., Dorny P., Vercruysse J.**  
Infestation de strongles chez le cheval au Nord Viêt Nam

Cette étude, basée sur le comptage des œufs de strongles dans les matières fécales et les coprocultures, a montré que les infestations causées par les strongles digestifs étaient une contrainte importante à la santé du cheval adulte au Nord Viêt Nam. Les chevaux de bât des zones montagneuses ont excrété en moyenne 2 053 œufs par gramme de matières fécales (opg), alors que l'opg moyen des chevaux de trait du delta du fleuve Rouge a été de 732. Les *Cyathostoma* spp. ont été les plus abondantes dans les coprocultures, alors que les taux de *Strongylus* spp. ont été inférieurs à 7 p. 100. Parmi tous les chevaux, 63 p. 100 auraient pu bénéficier d'un traitement anthelminthique puisque leur nombre d'opg a été supérieur à 500. D'autres études sur l'épidémiologie des strongles devraient être menées avant que des recommandations puissent être faites pour la mise en place d'un programme de traitement.

**Mots-clés :** Equidae - Cheval de trait - Animal de travail - *Cyathostoma* - *Strongylus* - Viêt Nam.

## Resumen

**Holland W.G., Geurden T., Do T.T., Dorny P., Vercruysse J.**  
Infecciones por estróngilos en caballos de Vietnam del Norte

Los resultados del presente estudio, basado en conteos fecales de huevos y cultivos fecales, mostraron que las infecciones por estróngilos fueron un obstáculo importante para la salud de los caballos adultos en Vietnam del Norte. En manadas de caballos de las áreas montañosas, el conteo fecal medio de huevos fue de 2053 huevos por gramo (EPG), mientras que en caballos de carruaje del delta del río Rojo fue de 732. *Cyathostoma* spp. fue el más abundante de todos los cultivos fecales, mientras que la prevalencia de *Strongylus* spp. fue de menos de 7%. Aparentemente, 63% de todos los animales fueron elegibles para el tratamiento, debido a que presentaron conteos de huevos superiores a 500 EPG. Es necesaria una investigación más profunda de la epidemiología de las infecciones por estróngilos en los caballos de Vietnam del Norte, antes de poder recomendar programas de tratamiento.

**Palabras clave:** Equidae - Caballo de tiro - Animal de trabajo - *Cyathostoma* - *Strongylus* - Vietnam.