I. O. Onyali [1]
C. O. E. Onwuliri [2]
J. A. Ajayi [2]

# *Strongyloides papillosus* infestations of lambs in Plateau State of Nigeria

**ONYALI (I. O.), ONWULIRI (C. O. E.), AJAYI (J. A.).** Infestations des agneaux par *Strongyloides papillosus*, dans l'État du Plateau, Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1989, **42** (2) : 223-226.

**L'apparition fréquente d'infestations patentes par *Strongyloides papillosus* chez des agneaux de moins d'une semaine est observée, et il est suggéré qu'un court intervalle de génération ou qu'une infestation prénatale en soient la cause. Les effets pathogènes liés à de fortes infestations chez les jeunes agneaux provoquent anorexie, perte de poids, diarrhée et anémie modérée. Les agneaux sont généralement très faibles, incapables de se tenir debout et restent prostrés. La mort suit habituellement cet état et trois agneaux examinés ont révélé une grave entérite. On a noté aussi de graves dermatites sur les côtes et l'abdomen. Les études d'épidémiologie, basées sur le comptage des oeufs de vers récoltés mensuellement sur une période de 12 mois, ont mis en évidence des nombres élevés en octobre et novembre, moyens de mai à août et bas de février à avril. Les comptes d'oeufs par gramme de fèces étaient de l'ordre de 100 à 18 000.** *Mots clés* : Agneau - Helminthose - *Strongyloides papillosus* - Épidémiologie - Nigeria.

## INTRODUCTION

*Haemonchus contortus, Trichostrongylus colubriformis, Oesophagostomum columbianum, Strongyloides papillosus, Trichuris ovis* and *Gaigeria pachyscelis* are the strongyle species of lambs in the Plateau State of Nigeria, as they are encountered in lambs brought for *post-mortem* examination at the National Veterinary Research Institute, Vom. These are essentially parasites of older lambs since under conditions of good management, younger lambs do not encounter these infestations till later in life. Of these, *H. contortus* is the main strongyle species seen and to a lesser extent *Trychostrongylus* spp. There has therefore been the tendency for much pre-occupation with these two parasites and little attention has been paid to *S. papillosus*. Under the free range management system, this nematode is encountered usually as light infestations. Probably for this reason they have been considered harmless. With the increase in the Plateau area of stationary sheep farms coupled with the short comings in management, *S. papillosus* is becoming common both in the older lambs and in lambs of one week old or less (ONYALI, 1978, unpublished).

Although these parasite populations have been regarded as harmless, their presence together with concurrent parasitic infestations and the nutritional status of the host determine the degree of pathogenicity. Deaths of calves reported from the local Fulani cattle owners in the Plateau, due to naturally acquired infestations of *S. papillosus*, have resulted in increase of awareness of its pathogenicity (3). This paper reports on the observations made on young lambs during visits to the field and those brought in for *post-mortem* examination. The occurrence and seasonal incidence of *S. papillosus* are also reported.

## MATERIALS AND METHODS

### *Post-mortem* examinations

A total of 20 lambs (under 1 week to 2 months old) were autopsied at the diagnostic department of the National Veterinary Research Institute, Vom, between March and December 1986. These included dead and very weak, emaciated and dehydrated lambs submitted to the laboratory and those taken during field trips. They were examined for pathogenic effects associated with strongyloidosis (7). Other examinations included faecal worm egg counts and *post-mortem* worm counts. Worms were identified by the criteria of SOULSBY (5).

### Epidemiology studies

This was done to provide data on the occurrence and seasonal incidence of *S. papillosus*, and was based on worm egg counts. The lambs used in this study were chosen from stationary flocks of five different sheep farms around Vom. In each flock four lambs were chosen from the youngest age-group after they have been screened and found positive for *Strongyloides* infestation. They were then identified by numbered ear tag and faecal samples were collected from their

1. Department of Parasitology, National Veterinary Research Institute, Vom, Plateau State, Nigeria.

Current address : Department of Parasitology/Entomology, Anambra State University of Technology, P.M.B. 5025, Awka Campus, Awka, Anambra State, Nigeria.

2. Department of Zoology, University of Jos, Plateau State, Nigeria.

Reçu le 16.06.88, accepté le 01.07.88.

rectum each month for examination. All the sheep were less than two months at the start of the experiment. A total of 240 faecal samples were examined at the rate of twenty per month from April 1986 to March 1987. The worm egg counts per g of faeces were done by the McMaster method.

The maximum and minimum temperature and rainfall were obtained from the meteorological station of the National Root crops Research Institute, Vom.

## RESULTS

Of the 20 lambs examined at *post-mortem*, 75 per cent were positive for *S. papillosus* worm counts which ranged from 125-2,520. Sixty-five per cent were positive for egg counts and this ranged from 1,000 to 30,000 eggs/g of faeces. Forty per cent of these had enterities of the upper small intestine and only 25 per cent had both enterities and dermatitis.

Pathogenic effects associated with heavy infestations in young lambs consisted of anorexia, loss of weight, diarrhoea and a moderate anaemia. The lambs were usually very weak, unable to stand and laying prostrate. Death usually followed at this stage and three such lambs (approximately 2-4 weeks old) examined showed severe enteritis. There were also severe dermatitis noticed around the flanks and abdomen. The high egg counts of *S. papillosus* and the relative absence of other strongyles, the clinical picture of helminthiasis and the absence of any other recognizable disease strongly suggested that the deaths which had occurred were due to this parasite.

The seasonal incidence of *S. papillosus* is summarised in figure 1(A). Although there were differences in the levels of worm egg counts between farms, the patterns of seasonal fluctuations in counts were closely parallel for all the lambs within each farm.

The similarity was considered sufficient to justify a mean ± S.E. result for all the lambs. The egg counts per g of faeces ranged from 100 to 18,000. The temperature and rainfall pattern is shown in figure 1(B, C).

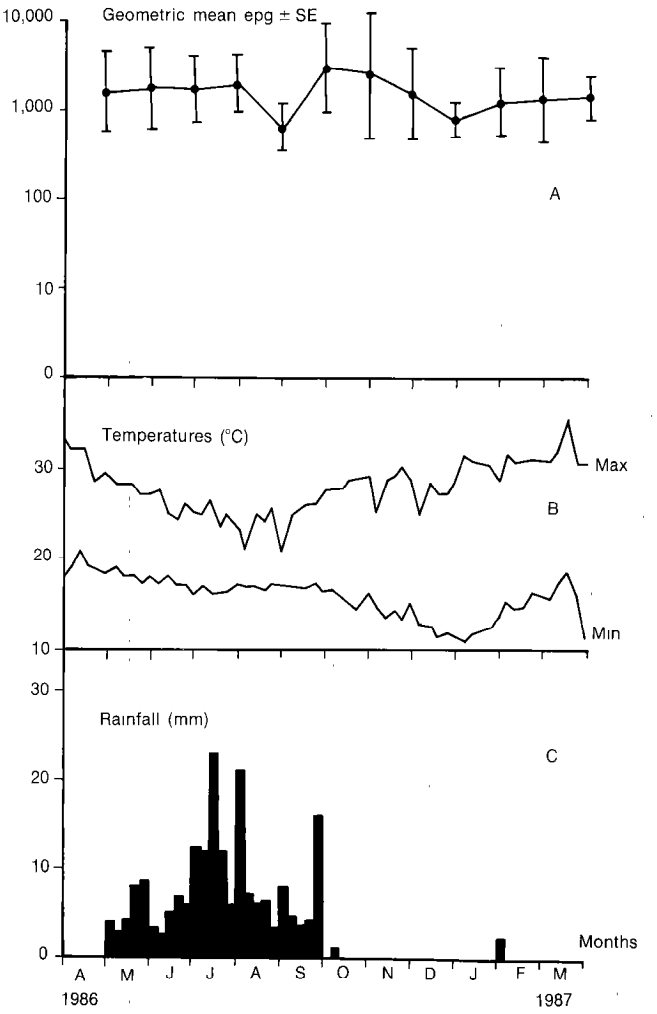


*Fig. 1 : Relationship between group mean faecal egg counts of* Strongyloides papillosus *in lambs at Vom and temperatures and rainfall.*

## DISCUSSION

The Plateau State of Nigeria has two clearly defined seasons : the rainy season and the dry season. During the rainy season, which varies from five to seven months in the year, rapid development of parasites occurs and this results in the rapid spread of parasitic infestations. During the dry season parasite infestations of sheep are minimal and the development of parasite infestations will depend on the interactions between the ecological surroundings of the host and the life history pattern of the parasite.

On the Plateau, *S. papillosus* infestations was seen all the year round, the dry season conditions notwithstanding. Temperatures in the Plateau are adequate throughout the year for the larval development and survival. The main factor necessary for their survival would thus appear to be sufficient moisture. The infective larvae are susceptible to dessication (10), but the sheep owners' practice of stationing young lambs and adults together in a group on a piece of ground continually moistened with their fresh faeces and urine facilitates the rapid development of the eggs of this parasite to the infective stage even at the height of

Retour au menu



:he dry season. The occurrence of patent infections in lambs less than a week old contradicts reports from experimental infections in calves indicating that the prepatent period of infection of this parasite ranges between nine and eleven days (7, 8, 11) and fourteen days in goats (2). In agreement with this report is the observations of IKEME (3) who found that the ages of some calves showing patent infections observed during field visits were under the accepted pre-patent period of infection of the parasite. These observations suggest that pre-patent period of infection is shortened by tropical field conditions or that pre-natal infection contrary to accepted belief might be playing an important role in the spread of the parasite. Experimental studies in lambs to confirm these suggestions are being planned.

Infestations with *S. papillosus* have generally being considered to be non pathogenic. Works reporting deaths in sheep due to naturally acquired infestations are few. TURNER and WILSON (9) reported the death of three lambs. ROUND (4) mentioned deaths from heavy natural infestations in sheep in Kenya. Deaths from experimental infections in sheep have been reported by WOODHOUSE (12) and TURNER (7). The observations of IKEME (3) showed that death of calves may result from naturally acquired infestations with this parasite. Strongyloidosis however is primarily a disease of baby pigs. Producers who farrow pigs in unclean surroundings and maintain poor sanitation may experience up to 75 per cent mortality, with death occurring between ten to fourteen days of age (1). Observations from the present study tends to show that in the field where little attention is paid to the management of lambs, where nutritional level of the young lambs is low due to the local practice of depriving lambs of the bulk of essential milk which is sold, these parasites tend to become very pathogenic.

The early season rise of *S. papillosus* may be accounted for by its exceptionally short generation interval of about fourteen days and moderate fecundity (2). The sudden fall in September coincides with the time when infective larvae are expected to be high on pastures. This fall was probably a manifestation of self cure phenomenon first described by STOLL (6).

## ACKNOWLEDGEMENTS

The authors are grateful to the Director, National Veterinary Research Institute, Vom for permission to publish this paper and to Mr. Samuel Oc. OCHAI for typing the manuscript.

**ONYALI (I. O.), ONWULIRI (C. O. E.), AJAYI (J. A.).** *Strongyloides papillosus* infestations of lambs in Plateau State of Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1989, **42** (2) : 223-226.

**The frequent appearance of patent infestations of *Strongyloides papillosus* in lambs under one week is observed, and it is suggested that either the short generation interval or pre-natal infection is the cause. Pathogenic effects associated with heavy infestations in young lambs consisted of anorexia, loss of weight, diarrhoea and a moderate anaemia. The lambs were usually very weak, unable to stand and laying prostrate. Death usually followed at this stage and three such lambs examined showed severe enteritis. There were also severe dermatitis noticed around the flanks and abdomen. The epidemiology studies which were based on worm egg counts taken at monthly intervals for a twelve-month period showed high counts in October and November, intermediate counts in May to August and low counts from February to April. The egg counts per g of faeces ranged from 100 to 18,000.** *Key words* : Lamb - Helminthiasis - *Strongyloides papillosus* - Epidemiology - Nigeria.

**ONYALI (I. O.), ONWULIRI (C. O. E.), AJAYI (J. A.).** Infestaciones de los corderos por *Strongyloides papillosus*, en el Estado del Plateau, Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1989, **42** (2) : 223-226.

**Se observa la aparición frecuente de infestaciones patentes por *Strongyloides papillosus* en corderos de menos de una semana ; se sugiere que la causa es un intervalo corte de generación o una infestación prenatal. Los efectos patógenos ligados con importantes infestaciones en los jovenes corderos provocan anorexia, pérdida de peso, diarrea y anemia moderada. Los corderos son generalmente muy debiles, incapaces de tenerse en pie y quedan postrados. Luego ocurre habitualmente la muerte y tres corderos examinados mostraron una grave enteritis. Se notaron también graves dermatitis sobre las chuletas y el abdomen. Los estudios epidemiológicos, basados sobre el recuento de los huevos de helmintos recogidos cada mes durante 12 meses, evidenciaron números elevados en octubre y noviembre, medios de mayo a agosto y bajos de febrero a abril. Los números de huevos por grama de heces llegaban a 100 a 18 000.** *Palabras claves* : Cordero - Helmintosis - *Strongyloides papillosus* - Epidemiologia - Nigeria.

## REFERENCES


1. BATTE (E. G.), MONCOL (D. J.). Colostral infection of new born pigs by *Strongyloides ransomi*. *In* : SOULSBY (E. J. L.), ed. The reaction of the host to parasitism. *Vet. Med. Rev.*, 1967 : 272-276.
2. FABIYI (J. P.). Seasonal fluctuations of nematode infestations in goats in the Savannah belt of Nigeria. *Bull. epizoot. Dis. Afr.*, 1973, **21** : 277-286.
3. IKEME (M. M.). *Strongyloides papillosus* and *Neoascaris vitulorum* naturally acquired mixed infestations of calves in the Plateau area of Northern Nigeria and the treatment given. *Bull. epizoot. Dis. Afr.*, 1970, **18** : 339-349.
4. ROUND (M. C.). Observations on *Strongyloides papillosus* infection. The treatment of heavy naturally acquired infections of sheep in Kenya. *Br. vet. J.*, 1963, **119** : 253-262.
5. SOULSBY (E. J. L.). Textbook of Veterinary Clinical Parasitology. I. Helminths. Oxford, Blackwell Scientific Publications, 1965. (Vol. I).
6. STOLL (N. R.). The occurrence of self-cure and protection in typical nematode parasitism. *J. Parasit.*, 1928, **15** : 147.
7. TURNER (J. H.). Experimental strongyloidiasis in sheep and goats. II. Multiple infections : Development of acquired resistance. *J. Parasit.*, 1959, **45** : 76-86.
8. TURNER (J. H.), SHALKOP (W. T.), WILSON (G. I.). Experimental strongyloidiasis in sheep and goats. IV. Migration of *Strongyloides papillosus* in lambs and accompanying pathologic changes following percutaneous infection. *Am. J. vet. Res.*, 1960, **21** : 536-546.
9. TURNER (J. H.), WILSON (G. I.). An epizootic of strongyloidiasis in lambs. *Vet. Med.*, 1958, **53** : 242-243.
10. TURNER (J. H.), WILSON (G. I.). Experimental strongyloidiasis in sheep and goats. V. The effect of certain environmental conditions and chemicals on the infective larvae of *Strongyloides papillosus*. *J. Parasit.*, 1961, **47** : 30.
11. VEGORS (H. H.). Experimental infection of calves with *Strongyloides papillosus* (*Nematoda*). *Am. J. vet. Res.*, 1954, **15** : 429-433.
12. WOODHOUSE (C. A.). Observations on pathogenicity of *Strongyloides* parasites in ruminants. *J. Am. vet. Med. Ass.*, 1948, **113** : 354-356.