

## Prevalence Rate of *Ascaridia galli* in some poultry farms in Khartoum State, Sudan.

Hanan A.M. Karar<sup>1</sup>; Abdalla, H.S<sup>2</sup> and. Elowni, E. E<sup>2</sup>.

(1) Central Veterinary Research Laboratories, Soba, P. O. Box 8067, Al Amarat, Khartoum, Sudan. (2) Department of Parasitology, Faculty of Veterinary Medicine, University of Khartoum, P. O. box 32, Khartoum North, Sudan

### ملخص البحث

فحصت في هذه الدراسة 760 أمعاء دجاج أجنبي ومحلي ذبح خلال الفترة من أبريل إلى أكتوبر 2000. جمعت العينات من مزارع دجاج في الباقير ، حلة كوكو ، الحاج يوسف، الجريف شرق، شمبات والحلفاية ومن سوق الخرطوم بحرى. وجدت 250 عينة ومن هذه العينات (760) مصابة بدودة اسكارديا الطيور (*Ascaridia galli*) وبلغت نسبة الإصابة العامه %32.89 بواقع %46.53 للدواجن الأجنبية و%10.18 للمحلية وهى نسبة عالية.

### Summary

**In this study, 760 intestines of slaughtered commercial exotic and indigenous chickens were examined during the period April-October, 2000. The chickens originated from poultry farms at El Bageir, Hillat Kuku, El Hag Yousif, El Gereif East, Shambat and El Halfaya and Bahri market. Out of these 760 intestines, 250(32.89%) were infected with *Ascaridia galli* (*A. galli*). The prevalence rate was 46.53% and 10.18% in the exotic and indigenous chickens, respectively. This indicated that the overall prevalence rate was high.**

### Introduction

Traditionally, poultry production in the Sudan was practised by rearing indigenous birds at the backyard of the house. Farming on intensive scale has developed after the introduction of exotic breeds and establishment of poultry farms around Khartoum in the early seventies (Ali, 1989).

Investigations on parasitic infections revealed the occurrence of *Ascaridia galli* (*A. galli*) infection as early as 1956 in Khartoum, 1958 in Malakal and 1968 in Darfur region (Eisa *et al.*, 1976). They found that the parasite was present in most of the exoic breeds, especially White Leghorn in Khartoum and other towns, viz, Wad Medani, Malakal and ElObied. Eisa *et al.* (1976) also reported that, egg production at Malakal poultry farm dropped from 300 to about one dozen of egg per day due to *A. galli* infection and that production returned to normal following anthelmintic treatment. Moreover, Saad *et al.* (1989) reported on *A. galli* infection in Kordofan region. More recently,

a survey conducted at Ed Damar Province, River Nile State, during the period 1993-1997 reported a prevalence rate of 2.5-9.1 % for *A. galli* infection in relation to other parasitic infections (El Hussein *et al.*, 1998). In another survey, Ali (1994) showed that the prevalence of *A. galli* infection was higher in exotic than indigenous chickens in Khartoum, El Obied and Wad Medani.

This survey was intended to determine the prevalence of *A. galli* infection in some localities in Khartoum State during the period April- Oct., 2000.

### **Materials and Methods**

#### **Study Area:**

The survey covered some parts of Khartoum North including Hillat Kuku, El Hag Yousif, El Gerif East, Shambat and El Halfaya as well as El Bagier; a township which is administratively affiliated to the neighbouring Gezira State.

#### **Birds:**

Seven hundred and sixty birds including 475 (62.5%) exotic and 385 (37.5%) indigenous chickens were examined. The foreign breeds were of different age groups. They were kept in commercial poultry farms and purchased from Bahri market of Khartoum North.

#### **Post-mortem examination:**

The birds were euthanized and their gastrointestinal contents were examined for the presence of adult parasites as follows:

- 1- The gastrointestinal tracts of the exposed carcasses were removed intact. Double ligatures were applied to each part to prevent confluence of contents between the various parts.
- 2- Each part was then separated, placed into a container, opened by a pair of scissors through a longitudinal incision and its contents were examined separately for adult parasites by the usual procedure of washing, sedimenting and decanting (Eisa *et al.*, 1976).
- 3- Adult parasites encountered were removed, collected, preserved in 10% formalin and immersed in lactophenol for overnight until they became clear prior to examination.
- 4- The adult worms were identified according to Dunn (1978) and Soulsby (1982).

### **Results**

The results obtained showed that 250 out of 760 birds were infected with *A. galli*. This showed an overall prevalence rate of 32.89% with a range of 20-60% (Table 1). Prevalence rate were 46.53% in exotic and 10.18% in indigenous chickens (Table 2). In relation to the season, the prevalence rate in summer (April-June),

reached 52.94% while in rainy season (July-October) it was 27.12% (Table 3).

**Table 1: The monthly prevalence rates of *A. galli* infection in exotic and indigenous chickens in some poultry farms in Khartoum State during the period April-October, 2000.**

Month	No. examined	No. infected	Prevalence rate
April	40	20	50.00
May	50	30	60.00
June	80	40	50.00
July	110	40	36.30
August	200	40	20.00
September	160	50	31.10
October	120	30	25.00
<b>Total</b>	<b>760</b>	<b>250</b>	<b>32.89(Overall)</b>

**Table 2: The prevalence rates of *A. galli* infection in exotic and indigenous chickens during the period April-October 2000 in in some parts of Khartoum State**

Source of chickens	No. examined	No. infected	Prevalence (%)
Exotic	475	221	46.53
Indigenous	285	029	10.18
<b>Total</b>	<b>760</b>	<b>250</b>	<b>32.89 (overall)</b>

**Table 3: The Seasonal prevalence rates of *A. galli* infection during summer (April-June) and rainy season (July-October) in some parts of Khartoum State**

Season	No. examined	No. infected	Prevalence rate
Summer	170	090	52.94
Rainy season	590	160	27.12
<b>Total</b>	<b>760</b>	<b>250</b>	<b>32.89</b>

### Discussion

The results obtained in this study showed that the overall prevalence rate of *A. galli* infection in surveyed chickens in some parts in Khartoum North was 32.89%. Although this rate is higher than that of Ali's (1994), who reported a prevalence of 10.3% in Khartoum State, both findings indicate that the parasite is quite prevalent in chickens in the study area. The parasite is also prevalent in many parts of the world. According to Permin (1997), the prevalence rate of infection was 7% in Germany, 13% in Bavaria and 2 - 20% in Switzerland. Wilson *et al.* (1994) reported a prevalence rate of 40% of *A. galli* infection in a commercial farm holding about 6000 broiler chickens 23-39 days old. Variation in these prevalence

rates of infection may be attributed to several factors including management practices, favourable climatic conditions conducive for the development of the infective stage, seasonality, lowered body resistance of chickens resulting in more parasitic establishment in the GI tract and sensitivity of techniques adopted for examination.

In a study conducted in Bangladesh, Roy (2002) reported that infections with *A. galli* were 75% and 51% in indigenous and exogenous chickens, respectively; such infections were found to cause economic losses. Weight loss of chickens due to *A. galli* infection was reported by Malviya *et al.* (1988). In addition, a decrease in egg production in chickens infected with *A. galli* was reported by Fatihu *et al.* (1992), Permin and Hansen (1998) and Matta (1981).

In the present study, the prevalence rate of *A. galli* infection is higher in exotic (46.53%) than in indigenous chickens (10.18%). These results are more or less similar to that reported by Ali (1994) in both exotic and local chickens in Khartoum and El Obeid. We observed that the worm burden was much greater in exotic than indigenous chickens. This finding is in agreement with the observation of Saad *et al.* (1989) who believed that *A. galli* infection is highly prevalent among exotic breeds of chickens that are kept in crowded pens; a condition that facilitates spread of infection while the indigenous chickens are usually maintained under back yards management system where they are exposed to direct sunlight that destroy the infective larva (L2) inside the egg, which naturally does not hatch outside the host. The larvae within the eggs are long-lived and very resistant to cold and to most chemical disinfectants (Anon, 1985). In cool, moist environments they may survive for several years but they are killed by heat, desiccation or direct sunlight.

The difference in infection rates could also be attributed to other factors. For example, labourers who move in between pens or from one farm to another, thus they may transfer the infective stage of the parasite through contamination of feed, soil, bedding, fomites and water. The variation, however, may simply be due to variation in susceptibility of different breeds or as a result of variation of the immune status.

In this study, a high trend prevalence rate of *A. galli* infection was observed in the summer (April-June); a similar observation was made by El Hussein *et al.* (1998) who found that *A. galli* infection was most prevalent during summer (March-June) in Ed Damer Province, River Nile State. The effect of temperature on the development of eggs to infective larvae was emphasized by Urquhart *et al.* (1988).

In contrast to Newcastle disease, Marek's disease, respiratory diseases and coccidiosis, which attract most of the attention of farms owners, infections with gastrointestinal nematodes receive little attention. *A. galli* is one of the nematodes that causes serious infection (Eisa, 1966) and sometimes results in death of infected birds (Agab, 1990). Since the life cycle of this parasite is direct by the faecal-oral route through contamination of soil, litter, bedding, fomites, feed and water, the level of infection is therefore dependent on the type of management and standard of hygiene (Bisgaard, 1992). Studies on the infective stage (L2) showed that *A. galli* eggs could survive for at least 4 years under Denmark conditions (Anon, 1985; Darcof, 2000). Therefore, consistent hygienic measures should be taken; the faeces being removed and burnt while still fresh and the pens well cleaned. All pens and runs should have impervious floors, not earth floors. Access to the transport host should be prevented; but this and, to a lesser extent, the other hygienic measures are difficult to apply in indigenous chickens reared in backyard management system

#### Acknowledgements

The authors would like to thank Dr. El Amin E. D M.; Prof. Osman, A. Y. and Dr. Magdi Badawi A/Rahman for critical reading of the manuscript. Thanks are also extended to the Director/ Central Veterinary Research Laboratories, Soba and the Director General of the Animal Resources Research Corporation for permission to publish this article.

#### References

- Agab, H. (1990).** *Sudan J. Vet. Sci. Anim. Husb.*, **29**(2): 85-86.
- Ali, A.N. (1994).** Helminth Parasites of Chickens in the Sudan with special Reference to *Raillietina tetragona* Infections. M.Sc. Thesis, Faculty of Veterinary Science, University of Khartoum, Sudan.
- Ali, S.F. (1989).** Some studies on poultry coccidia in Khartoum Province. M.Sc. Thesis, Faculty of Veterinary Science, University of Khartoum, Sudan.
- Anon. (1985).** Msc / Diploma in tropical Veterinary Science. Centre of Tropical Veterinary Medicine, Royal Dick Veterinary Medicine, Edinburgh, U.K.Pp. 59-60.
- Bisgaard, M. (1992).** *Inernat. J. F. Microbiol.*, **51**: 219-224.
- Darcof, (2000).** Danish Research Centre for Organic Farming. Darcof publications, Copenhagen, Denmark.Pp. 272.
- Dunn, A. M. (1978).** Veterinary Helminthology, 2<sup>nd</sup> ed. William Heinemann Medical books Ltd., London, UK.Pp. 62-63.

- Eisa, A. M. (1966).** *Sudan J. Vet. Sci Anim Husb.*, **7**(2): 85-98.
- Eisa, A. M.; El bedawi, E. S. and Saad, M. B. A (1976).** *Sudan J. Vet. Sci. Anim. Husb.*, **17**(2):68-76.
- El Hussein, A. M.; El Ghali, A.; Mohamed, S. A. and Taha, K. M. (1998).** *Sudan J. Vet. Sci. Anim. Husb.*, **37**(1-2): 105-113.
- Fatih, M. Y.; Ogbogbo V. C.; Njoku, C. O. and Saror, D. I. (1992).** *Bull. Anim. Prod. Afri.*, **40**:19-24.
- Malviya, H. C.; Dwivedi, P. and Verma, T. K. (1988).** *Vet. Parasitol.*, **28**:137-141.
- Matta, S. C. (1981).** *Indian J. Poult. Sci.*, **15**: 283-284.
- Permin, A. (1997).** Helminths and Helminthosis in Poultry with special emphasis on *Ascaridia galli* in Chickens. Ph.D. Thesis. The Royal Veterinary and Agricultural Sciences University, Copenhagen, Denmark.
- Permin, A. and Hansen, J. W. (1998).** Epidemiology, diagnosis and control of parasites, FAO/UN. Rome, Italy.
- Roy, D. K. (2002).** Helminthosis of free-range chickens in Bangladesh—with emphasis on prevalence and effect on productivity. MSc Thesis, The Royal Veterinary and Agricultural Sciences University, Copenhagen, Denmark.
- Saad, M. B. A.; El Sadig, A. A. and Shammat, A. M. (1989).** *Sudan J. Vet. Sci. Anim. Husb.*, **28**(2): 54-55.
- Soulsby, E. J. L. (1982).** Helminths, Arthropods and Protozoa of Domesticated Animals. 7<sup>th</sup> edn. Balliere Tindal, London. Pp. 163-165.
- Urquhart, G. M.; Armour, J.; Duncan, J. L. and Jennings, F. W. (1987).** Veterinary Parasitology. Longman group, U K Pp.
- Wilson, K. I.; Yazwinski, T. A.; Tucker, C. A. and Johnson, Z. B. (1994).** *Avian Dis.*, **38**: 158-160.