

## **The Occurrence of Nematodes in the Intestine of Local (Baladi) Chicken (*Gallus gallus domesticus*) in Jeddah Province – Saudi Arabia**

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### **Abstract:**

Thirty-Two local (Baladi) breed of chicken (*Gallus gallus domesticus*), from rural area of Jeddah were found to be infected with nematodes. Three species of nematodes were recorded from small and large intestine namely, *Ascaridia galli* (Ascaridiidae), *Subulura brumpti* (Subuluroidae), and *Capillaria caudinflata* (Capillariidae).

**Key words:** *Ascaridia galli*, *Subulura brumpti*, *Capillaria caudinflata*, *Gallus gallus domesticus*, Fowls, Jeddah.

### **Introduction :**

Nematodes of poultry infection are widely distributed in different parts of the world, and numerous research has been existed to prevent the mortality of poultry from parasitic diseases. The poultry nematodes fauna in Western of Saudi Arabia is neglectfully studied. Abu-Zinada (1993) reported the first record and prevalence of two nematodes species, *Heterakis gallinarum* and *Subulura suctoria* from the ceecal of Guinea fowl (*Numedia meleagries*). In 1998, the above author added one species of the family Diplotriaeidae (*Diplotriaeina divergens*), infecting dead mynah birds (*Gracula sp.*) obtained from Jeddah market. In the Eastern region of Saudi Arabia, Alsagabi (1998) recorded, three nematodes species from white leghorn chicken namely; *Ascaridia galli*, *Heterakis gallinarum* and *Subulura suctoria*. In Riyadh Al-mathal (1990) noticed that the ratio of infection with nematodes in pigeons was less than with Cestodes infection (17.6 % - 26.2 %). However, she found only one species *Ascaridia columbae* in pigeons and three others in fowl (same as in Alsagabi 1998 above). The first record of *Subulura brumpti* in Egypt was in 1949 (Fahmy,1952). Eshetu (2001), described five species of nematodes obtained from rural scavenging chickens in Addis Ababa, Ethiopia. Many different species of helminthes including *Ascaridia galli* and *Capillaria sp.*

were found in the intestinal tract of indigenous poultry in parts of Kenya (Irungu et.al, 2004). Barus and Sonin (1980), described two species of the genus, *Subulura*; *S. skrjabini* and *S. brumpti* parasitizing *Corturnix* (*Galliformes*) in India. A total of 18 species were detected from 100 chickens in Ghana to determine the prevalence and distribution of intestinal helminthes (Poulsen et.al 2000). El-Khawed et.al (1977) identified and exhibited 87% of the hens with mono–and polyinfections, of helminthes including *S. brumti* in Khartoum, Sudan.

To my knowledge, these nematodes have not been recorded from the local (Baladi) chicken in Jeddah area.

### **Materials and Methods:**

A total of 32 female local (Baladi) (*Gallus gallus domesticus*) breed chickens were purchased from Jeddah market during the fall and winter of 2004. They were originated from Jeddah district and its rural area such as, El-Khomrah, Ghran and Om-Jabalain villages. On return to laboratory, the birds were sacrificed and the intestine (small & large) tracts were removed, slit and incubated in warm normal saline (35-40 °C) for two hours. Recoverd nematodes were placed in distilled water for few minutes to wash and relax, then counted using a dissecting microscope. Male and female worms were separated, fixed immediately in 70% ethanol and retained for staining processes. Using standard techniques, worm specimens were dehydrated, stained, cleared in lactophenol solution (Schmidt 1992) and mounted in Berlese's media (Humason 1979). They were diagnosed and identified by using Schmidt's (1992), Soulsby's (1982) and Andreson's (1992) schematic key of nematodes families, genera and species.

### **Results:**

Nematodes infections were found in the small and large (caecum) intestines of 19 female local (Baladi) chicken *Gallus gallus domesticus* out of 32 chickens. Three nematode species were identified. Their systematic scheme and diagnostic characters are as follow:-

**1. *Ascaridia galli* (Schrank, 1788), Family: Ascaridiidae.**

Prevalence: in 11 out of 32 (Table 1)

Diagnostic characters: large nematodes, the male 9.3 cm female 12.0 cm long. Three large lips, esophagus 3.3 cm. The tale of the male has small alae and bears numbers of cloacal papillae (5-10 pairs). There is circular cloacal sucker (pre-anal suckers) and two equal spicules (Fig.1).

2. *Subulura brumpti* (Lopez-Neyra,1922) (Family: Subuluridae )  
Prevalence: in 4 out of 32 ( Table 1)  
Diagnostic characters: small nematodes, the male 9.26 mm female 11.38 mm long. Buccal capsule is small with three minute teeth. The esophagus has small swelling posteriorly, followed by a deep constriction and then a spherical bulb. The tail of the male is provided with large lateral alae and is curved ventrally. The pre-anal sucker is an elongate slit. There are number of pairs of small caudal papillae. The spicules are equal and alate. The vulva is situated just anterior to the middle of the body. (Fig.2)
3. *Capillaria caudinflata* (Molin,1858). (Family: Capillariidae).  
Prevalence: in 4 out of 32 (Table 1)  
Diagnostic characters: small nematodes, the male 9.2 mm female 15.8 mm long. Body is in two parts, the anterior part is longer and thinner (thread-like) which has slender (tube-like) esophagus without bulb. The esophagus is shorter in male 3.1 mm than female 5.8 mm, lips absent but has one spicule. Anus toward the end of the posterior part. The vulva is behind the esophagus-intestinal junction. The posterior end is bluntly rounded and dull. Eggs are oval in shape with two opercula, one at each end. (Fig.3).

#### **Discussion:**

The most dreadful and debilitating parasitic diseases of domestic animal, specially chickens and other poultry animals caused by nematodes species. In the present study one of the nematodes species, *Ascaridia galli* has a cosmopolitan distribution as a parasite of poultry. Its prevalence was 34.4% which represent a double of each of the two other species 12.5% for *Subulura brumpti*, and 12.5% for *Capillaria caudinflata*. Of the specimens examined, 19 chickens had parasites, whereas the remaining 13 had none, which gave an infection rate of 60% (Table 1). Although this ratio very much corresponds with the survey in Thailand (Ehlers-Bhodigen 1985) and with incidences of intestinal parasite in Pakistan (Hayat and Hayat 1983), it was not as high as in Kenya (Irungu et al, 2004) and in Ethiopia (Eshetu et al, 2001), whereas in Ghana West Africa all the examined chickens (100%) were infected with gastro-intestinal helminthes (Poulsen et al, 2000). In the mean time, the intensity records of *Subulura brumpti* and *Capillaria caudinflata* were much higher than *Ascaridia galli* in each infected chickens (Table 1). The relationship between worms sex (male and female) and their intensity was not significant.

Much has been written regarding diseases occur in domestic, farm-raised poultry. Only two of many diseases are notifiable and subject to governmental control; the avian influenza and Newcastle disease (ND) (Kaleta 1997). ND is a limiting factor for increasing poultry production in many tropical countries, where frequent reports indicate vaccination failures. In Denmark (Horning et al (2003) investigated the influence of Nematodes species *Ascaridia galli* on vaccinated chickens against ND virus under village conditions.

Vaccinating poultry naturally infected with helminth parasites or infected with *Ascaridia galli* post- vaccination against ND has proven to produce a significantly lower immunity against ND than in poultry which is parasite-free (Glukhor 1984).

These three present species are parasites of major clinical importance for poultry. Their records in Saudi Arabia therefore very important from veterinary point of view. The loss of chickens weight and general weakness could affect the production losses and death. Due to the great value of poultry production in the Kingdom of Saudi Arabia. Further study is needed.

**Table ( 1 )**  
 The prevalence and intensity of the nematodes  
 species in local (Baladi) breed chicken

The voucher species	No. of infected chicken	%	Number of worms in each chicken		Total	
			M	F		
<i>Ascaridia galli</i>	11	34.4	1	+	2	3
			3	+	8	11
			2	+	6	8
			6	+	7	13
			1	+	3	4
			5	+	5	10
			2	+	4	6
			1	+	1	2
			0	+	1	1
			0	+	2	2
			3	+	3	6
			24	+	42	66
<i>Subulura brumpt</i>	4	12.5	13	+	32	45
			6	+	16	22
			5	+	11	16
			9	+	15	24
						33
<i>Capillaria caudinflata</i>	4	12.5	16	+	20	36
			11	+	22	33
			3	+	12	15
			4	+	11	15
						34

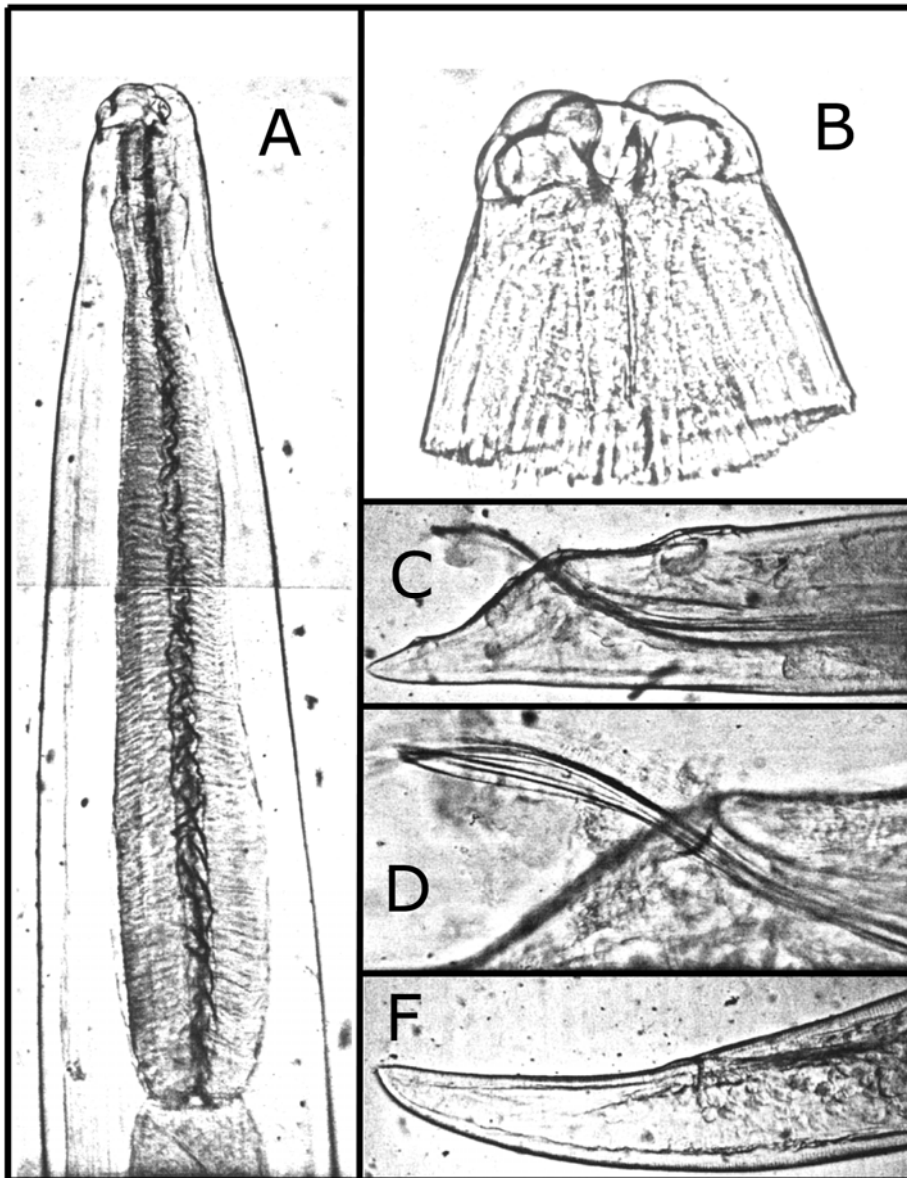


Fig. 1 *Ascaridia galli*: A. ventral view of the anterior portion showing the esophagus. B. Ventral view of the mouth showing the three lips. C & D Lateral view of posterior tail of male showing the alae and the spicules. E The posterior end of the female.

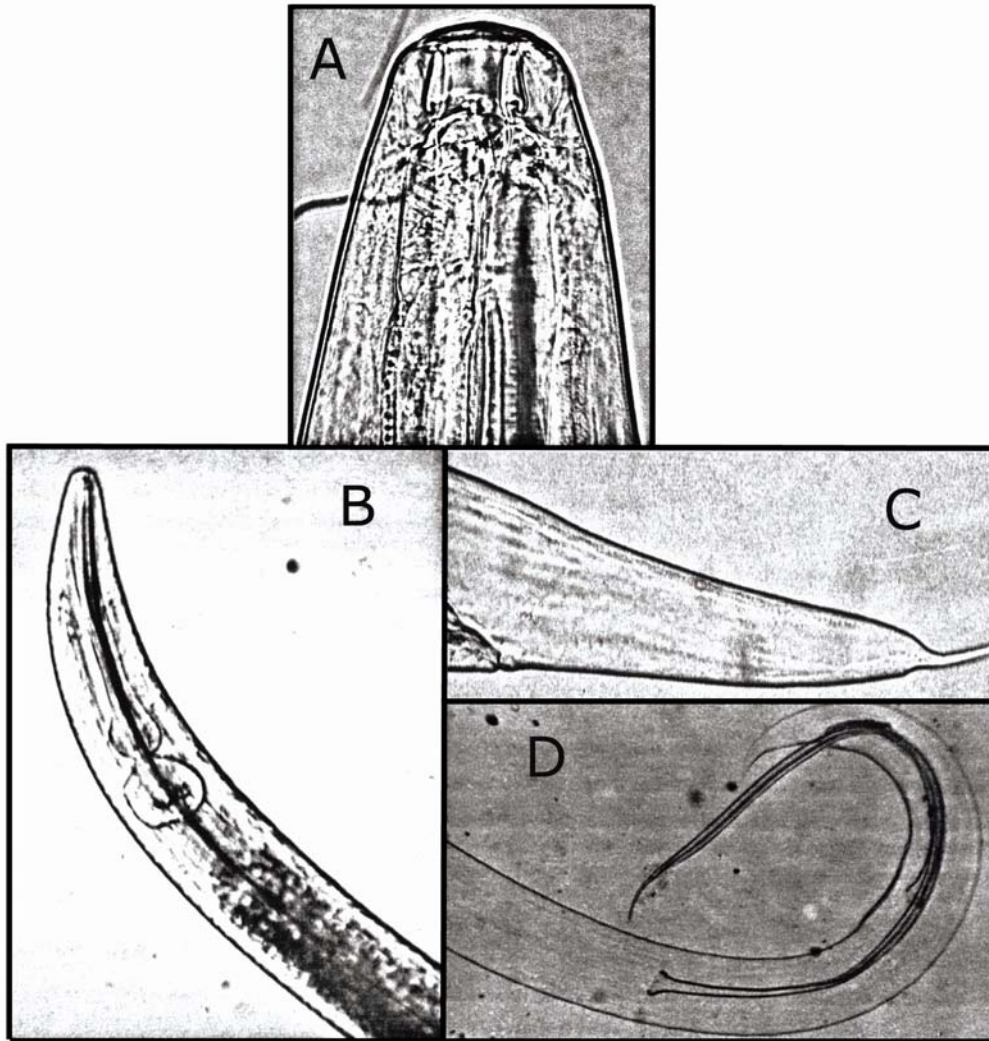


Fig. 2 *Subulura brumpti*: A. view of the anterior end showing the buccal capsule with teeth at the base. B. the anterior portion showing the esophagus with balb. C. The posterior end of the female. D. The lateral curved alae at the posterior end of the male showing the pre-cloacal sucker and spicules.

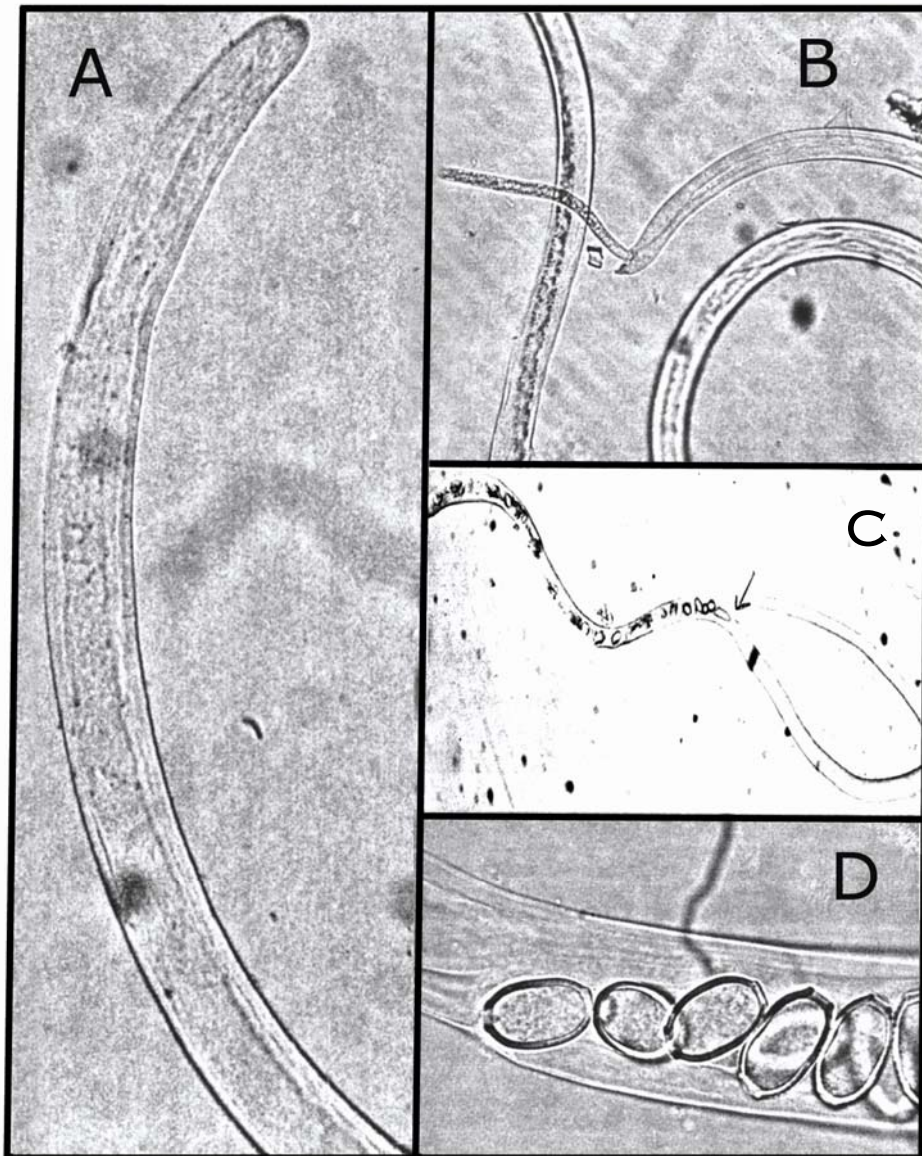


Fig 3 *Capillaria caudinflata*: A. The posterior end of the female. B. The posterior end of the male with single spicule. C. Vulva pointed with arrow. D. The eggs inside the female.



### References:

1. Abu-Zineda Najwa Y (1993). First records and Prevalence of the caecal Nematods, *Heterak gallinarum Subulura suctoria*, from the Guinea fowl, *Numedia meliagriss* in Saudi Arabia J.King Saud univ. vol.5 Agri. Sci. (1), pp.59-65.
2. Abu-Zineda Najwa Y (1998). A nematode parasite from the lung of mynah birds at Jeddah, Saudi Arabia J.Egypt Soc. Parasitol. 28 (3):659-63.
3. Al-mathal Ibtesam, M (1990). Morphological and classification studies on some Helminth parasites found in the intestines of some birds (Fowls and Pigeons) in Riyadh. M.Sc.Thesis; Girls College of Education in Riyadh.
4. Alsagabi Souad M. I (1998). Studies on the external and internal parasites infesting broilers and laying hens in Eastern region of Saudi Arabia with special reference to methods of control. Ph.D.Thesis;College of Science for girls.
5. Andreson, R.C. (1992) Nematode Parasites of vertebrates. Their development and Transmission C.A.B International. pp, 578.
6. Barus V., MD, Sonin (1980). Nematodes of the genus *Subulura* (Subuluridae) parasitizing *Corturnix (Galliformis)*. Folia Parasitol (Praha); 27(1):23-8.
7. El-Khawad, El-Badawi, and AM Eisa (1977), Helminthes in chickens in Sudan. Angew Parasitol; 18(3): 142-5.
8. Eshetu Y, E. Mulualem, H.Ibrahim, A.Berhanu, K.Aberra (2001). Study of gastro-intestinal helminthes of scavenging chickens in four rural districts of Amhara region, Ethiopia, Rev.Sci Tech. 20(3):791-6.
9. Ehlers-Bhodigen, S. (1985). Survey of parasitic helminthes of Poultry. Thai Journal of veterinary Medicines 15:267-267.
10. Fahmy, M.A.M, (1952) "New records of ecto-endoparasites of chickens in Egypt with special reference to the taxonomy of *Subulura brumpti*". J.parasitol, 38:2.
11. Glukhor, E.P (1984). The influence of *Ascaridia* on the immunity of chicken in following vaccination against new-castle disease. Cited from poultry abstracts vol. 10
12. Hayat, B. and, C.S. Hayat. (1983). Incidence of intestinal Parasites of chicken in Faisalabad District. Pakistan Veterinary Journal, 3:165-167.
13. Horning G.S. Rasmussen, A. Permin and M.Bisgaard (2003). Investigations on the influence of helminth parasites on vaccination of chickens against Newcastle disease virus under village conditions. Trop. Anim. Health Prod. 35(5):415-24.
14. Humason GL. (1979) Animal tissue techniques. 4<sup>th</sup> ed. San Francisco: WH. Freeman and Company, pp.106.

15. Irungu, LW, RN. Kimani, SM.Kisia. (2004). Helminth parasites in the intestinal tract of indigenous poultry in parts of Kenya. *J. S. Afr. Vet. Assoc*; 75(1): 58-9.
16. Kaleta EF. (1997), Epidemiology of avian diseases. *Acta. Vet. Hung.*45 (3) 267-80.
17. Poulsen J, A, Permin, O.Hindsbo, L. Yelifari, P. Nansen, P. Boch; (2000). Prevalence distribution of gastro-intestinal helminthes and haemoparasites in young scavenging chickens in upper eastern region of Ghana, West Africa. *Prev. Vet. Med.* 45(3-4): 237-45.
18. Schmidt, Gerald D. (1992). *Essential of Parasitology* 5<sup>th</sup> ed. Printed in U.S.A by Wm. C. Brown Publishers. Pp 174-180.
19. Soulsby, E.J.L; (1986). *Helminths, Arthropods and Protozoa of Domesticated Animals*. 7<sup>th</sup> ed. Builliere Tindall. Pp-809.

## تواجد الديدان الخيطية في أمعاء الدجاج البلدي في محافظة جدة المملكة العربية السعودية

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### الملخص :

تم في هذا البحث دراسة وصف وانتشار ثلاثة أنواع من الديدان الخيطية لأول مرة في مدينة جدة المملكة العربية السعودية. جمعت هذه الديدان من أمعاء ١٩ دجاجة من مجموع ٣٢ من الدجاج البلدي المعروف ( *Gallus gallus* ) *domesticus* المتواجد في أماكن متفرقة من ضواحي مدينة جدة مثل: الخمرة ووادي غران ووادي أم جبلين حيث بلغت نسبة الإصابة ٦٠٪. ونتج عن هذا الوصف التعرف على الأنواع التالية:  
Ascaridia galli من عائلة (Ascaridiidae) ، Subulura brumpti من عائلة (Subuluroidae) و Capillaria caudinflata من عائلة (Capillariidae).  
كما يعتبر النوع الأخير تسجيل نادر الانتشار في منطقة الشرق الأوسط.