Effects of Varying Temperatures on the Ex-uterine Development and Incubation Period of Eggs of *Ascaridia Galli*

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ABSTRACT: Temperature is considered one important environmental condition that controls the exuterine development of eggs of Ascarids to the injective stage and therefore is deemed to affect dissemination of the parasites. Effects of varying temperatures on post uterine development of eggs of A galli were investigated by incubation of mature eggs stripped from the uteri of live female nematodes. Specimens of the nematodes were dissected out from naturally parasitized native fowls purchased from local vendors in markets in Owerri area of Imo State, Nigeria. The eggs were placed in Petri dishes in small quantities of water and incubated in thermostat-filled ovens at temperatures varying from 0^0C to 40^0C for a maximum of 30days. No development was observed in the eggs at 0^0C and < 38^0C. The shortest incubation period was recorded at 30^0C while the longest was at 15^0C. Maximum embryonation (76.5%) was achieved at 280C (table1). These observations strongly suggest that the global warning maybe increasing the rate of dissemination of the parasites and related forms, including man's important ones, by hastening the exuterine development of the eggs of the nematodes to infective stages.
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INTRODUCTION

Ascarid nematodes of varying descriptions and severities of infections affect man and his domestic animals and constitute both medical and veterinary problems. Some have vertebrate host ranges that include man and his domestic animals and even wild vertebrates that make their control and eradication from human populations almost impossible. Investigations **Onyirioha, (1984) and Hodasi, (1969, 1978)** have shown that our domestic native chickens (Gallus gallus domesticus) are parasitized by many nematode species of which *A* Galli is the most important species in terms prevalence rate and intensity of infection. Though none of these worms are known to neither infect man nor cause direct harm to human, *A galli* is readily available for experimentations that may give insight into ecological requirements and valuable information on measures against the parasites and possible eradication of these human parasites. Study was therefore carried out to determine the effects of temperature on the exuterine development of the eggs of the nematodes.

MATERIALS AND METHODS

Mature eggs of Ascaridia galli were obtained from live gravid female nematodes which were dissected out from naturally infected native domestic fowls (*Gallus gallus domesticus* L.), purchased from local vendors in markets in Owerri area, Imo state, Nigeria. The eggs of *A galli* were stripped into Petri dishes from utri containing small quantities of tap water (about 2mm deep). The eggs were then covered with tissue papers and the Petri dishes covered with larger Petri dishes and placed inside thermostat- fitted ovens and incubated at temperatures 0^OC, 15^0C, 20^0C, 24^0C, 28^0 C, 30^0C 32^0C 36^0C and 38^0C respectively. Some of the eggs were also incubated at laboratory conditions. Eggs samples were picked with dropper pepite from the Petri dishes and examined at days intervals under the microscope. Small quantity of water was added each time to make up the loss to evaporation.

The time taken f or the coiled larvae to develop in each Petri dish was noted. The percentage embryonation was also, estimated with microscopic slide counter. In cases where the egg development was not seen after 20days, the eggs were re-incubated under laboratory (the parasite free) condition. When the infected chicks started passing out unsegmented eggs, they were sacrificed and examined intestinally for the nematode. The controls were similarly killed and examined for infection.

RESULTS

Most of the eggs *A galli* embryonated at 28^0C and the shortest incubation period was recorded at higher temperature (30^0C). It was found that incubation periods as well as the percentage embryonation of *A galli* eggs varied with temperatures. After 30 days of incubations, no development was seen among the eggs at 0^oC and <

38°C. (Table 1) and the subsequent incubation of these eggs under laboratory conditions produced no changes in their development, which eggs incubated initially under laboratory conditions embryonated under temperatures varying from 22o C to 25oC. All the chicks infected with the embryonated eggs harbour adult's nematodes proportionate with the numbers of the embryonated eggs with which they were infected. The embryonated eggs well fed to four 5-day old chicks raised under laboratory (parasite free condition four other chicks, in each case were kept as controls.

DISCUSSION/CONCLUSION

Helminthes encountered in the intestinal examination of our natural poultry birds **Fabiyi (1972), Hodas, (1969, 1978), Onyirioha (2000)** do not differ from those in similar studies **Cuvillor and Jones (1993), Kavetaegin (1975)** conducted in the chickens from other parts of the world **Shantron et al (1971), Rodsiyer (1972)** but further analysis of the results of the studies **Hodasi (1978), Onyirioha, (2000)** shows that our native chickens carried heavier intensities and some suggestions have been made to explain this. That it could be as a result of our traditional method of poultry keeping which still dominates modern battery system **Cuvillor and Jones (1992).** The birds, in traditional method, on free range, have access to variety of foods and also varied environmental conditions. In battery system, conditions could be controlled and health of the birds could be controlled and health of the birds could be monitored and sick birds promptly treated. The opposite here is different in traditional method. In our society, children and women are exposed to environmental harzards.

Children run around to play and women move about to attend to varied household duties and in so doing are exposed to weather changes and possibly infectious agents of human disease. The parasite implication of global climate change could they be also tackled by more and advanced investigations on the effect of environment on animal and human infections and the valuable information gained utilized to counter human parasitic infection. These experiments clearly demonstrated that global warning may be increasing the exuterine development of eggs of Ascarids and may also be hastening the dissemination of parasites of medical or veterinary importance.

Table 1: Duration and percentage Embryonation of Egg of *Ascaridia galli* from Live Specimens at Varying Temperatures

Temperature (°C)	%Embryomation	Time (days)
0	0.0	30
15	65	23
20	68.5	16
24	71.5	13
28	76.5	12
30	75	11
32	74	12
34	55	12
36	38	20
38	0.0	30
18-25	25	15

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