



## ORIGINAL RESEARCH ARTICLE

## A Survey on Tick Infestation in Domestic Birds Sold at Gwagwalada Market, Abuja, FCT, Nigeria.

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Received for publication: January 23, 2016; Accepted: February 14, 2016

**Abstract:** Ticks transmit a greater variety of pathogenic micro-organisms than any other arthropod vector group, and are among the most important vectors of diseases affecting animals. A survey on the prevalence of tick species infesting domestic birds sold in Gwagwalada main market, Abuja between April and July, 2015. A total of 450 birds were examined by feather separation with fingers and a pair of forceps to expose the skin of the birds for presence of the ticks. An overall prevalence of 25.6% was observed. Out of the 150 domestic fowls examined 62(53.9%) were infested, 44(29.3%) of the 150 Guinea fowl and 9(6.0%) of the 150 Pigeons were infested. Of all the ticks identified, 93(51.4%) were from the Domestic Fowls and 77(42.5%) from the Guinea fowl and 11(6.0%) from Pigeon. Thirty (32.3%) of the ticks from the Domestic fowls were *Argas persicus*, 25(26.9%) *Argas walkerae*, 20 (21.5%) *Ornithodoros moubata* and 18(19.4%) *Ornithodoros savignyi*. Similarly, 34(44.2%) of the ticks from Guinea fowl were *A. walkerae*, 20(28.2%) *O. moubata* and 23(32.4%) *O. savignyi*. Five (45.5%) of the ticks from Pigeon were *A. persicus*, 4 (36.4%) were *A. walkerae*, 2 (18.2%) were *O. moubata* and no *O. savignyi*. Observation on the location of tick from the hosts body showed highest prevalence was found under the wings (55.2%) and lowest on the head & neck (5.00%). The result of this research revealed that Gwagwalada market poultry section is endemic of tick infestation. Chemical control with acaricides and improved management and sanitation of the poultry cages in the market should be enforced.

**Key Words:** Acaricides, Poultry birds, Gwagwalada market, Prevalence, Tick

### Introduction

Poultry has been interpreted to mean all birds reared or hunted for the purpose of eggs, meat fertilizer production (Oluyemi and Roberts, 2002). Local chickens, guinea fowls, geese and turkey have been used in small scale indigenous poultry production because of divergent roles it plays. Sale of eggs and live birds of urban and rural market is perhaps the only source of cash earnings available to rural families (Nwangu, 2002). Poultry farming refers to keeping domestic birds for egg and meat production. Poultry farming embraces keeping all types of domestic birds including chickens, guinea fowls, turkeys, ducks, geese, pigeons, etc. (Alyeghago, 1983). "Poultry, a sub-segment under Nigeria's agriculture sector spurs agriculture with its estimated average annual growth of 6 percent both in chicken (broiler) meat and hen egg production since 2007. Currently, the size of Nigeria's poultry industry is estimated to have reached N373.03 billion in 2013 (Agusto and Co, 2014). However, there is a consensus that about 90% of this figure derived from indigenous chickens, ducks, turkeys and others served as a source of animal protein in Nigeria accounted to almost 25% of local meat production (Nwangu, 2002).

Ectoparasites hamper poultry production as they affect the health, growth and productivity through their feeding habits; by sucking their blood, tissue fluid and transmitting deadly pathogens. Some of the most common parasitic arthropods of poultry include lice, ticks mites, flies, etc. The feeding nymphs and adults of these ectoparasites cause irritation, restlessness and debility. In heavy

infestations fatal anaemia may result. Ticks particularly, *Argas* species cause tick worry of birds and paralysis of poultry and transmit. Ticks cause substantial losses in cattle production, in terms of diseases, reduced productivity and fertility and often death, and are economically the most important ectoparasites of cattle (Rajput *et al.*, 2006). Ticks suck blood, damage hides and skins, introduce toxins and predispose cattle to myiasis and dermatophilosis (Gates and Wescott, 2000; Mtshali *et al.*, 2004). Furthermore, they reduce body weight gains and meat quality, in addition to creating sites for secondary invasion by 2 pathogenic organisms (Gates and Wescott, 2000). More significantly, ticks transmit diseases from infected birds to healthy ones. Ticks transmit a greater variety of pathogenic micro-organisms than any other arthropod vector group, and are among the most important vectors of diseases affecting animals (Jongejan *et al.*, 2007).

### Materials and Methods

#### Method of Examination

The survey was carried out to determine the occurrence and prevalence of ectoparasitic ticks on domestic birds sold at Gwagwalada Market between April and July, 2015. The domestic birds selected for the study are chickens (domestic fowl), guinea fowls and pigeons. Gwagwalada market was visited four times at regular intervals for the sample collection, each of the three birds were examined for the presence of ectoparasitic ticks. A total of four hundred and fifty (450) birds; one hundred and fifty (150) domestics' fowls, one hundred and fifty (150) guinea fowls, and one

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hundred and fifty (150) pigeons were examined. The birds were picked from their cage with the consent of their owners and help from friends who assisted in restraining the birds prior to physical examination and tick collection.

**Isolation of Ectoparasites**

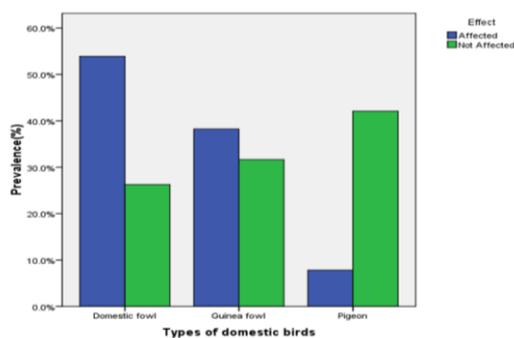
The parts of the bodies examined, as recommended by Nwangu (2002), were head and neck region; under the wings; around the thighs and breast; and around the vent (cloacae). Each bird was examined by feather separation with fingers and pair of forceps to expose the skin of the birds for presence of the ticks. On physical examination, birds were marked positive or negative to infestation appropriately. On positive examination some samples of the parasites were isolated using a pair of forceps and collected into specimen bottles and Petri dish for each species containing 10% formalin for fixation of the parasites for onward identification of the samples at the Biology Laboratory of the University of Abuja, Abuja- Nigeria. The total numbers of the species of ticks collected were transferred to biology laboratory in the Department of Biological Sciences, University of Abuja, Main Campus.

**Identification of the Ectoparasites**

Samples were viewed under electronic - stereo microscope, using X10 magnification power. This was done by placing each specimen on to a clean grease free slide with the aid of a pair of forceps. The samples were then identified by means of their taxonomic structures using the key to identification of ectoparasites by Walker (2003). All the samples were treated in this manner, taking note of the location of the host's body where they were isolated from. The record of birds infected and ectoparasite species involved were determined.

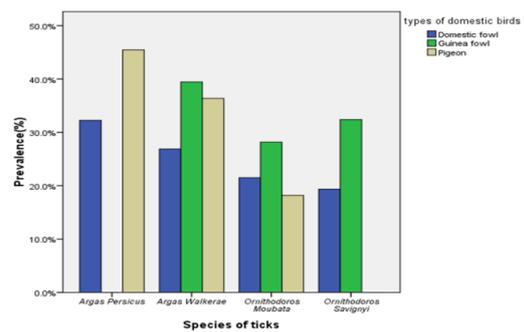
**Results**

From the analysis, out of the 450 birds examined, a total of 115(25.6%) were infected with ticks. 62(53.9%) of the total of 150 domestic fowls examined were infected with ticks, 44(29.3%) Guinea fowl and only 9(6.0%) of the Pigeons were infected as seen in Figure 1.

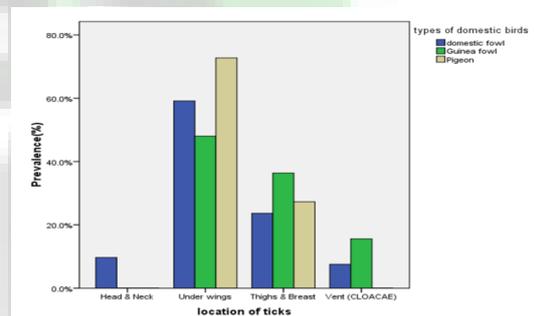


**Figure 1:** Bar graph showing the prevalence of ticks on birds' species sold in Gwagwalada market

From Fig 2, 93 (51.38%) of all the ticks identified were from the Domestic Fowls and 77(42.54%) from the Guinea fowl and 11(6.01%) from Pigeon. 30(32.3%) of the ticks from the Domestic fowls were *A.persicus*, 25(26.9%) were *A.walkerae*, 20(21.5%) were *O.moubata* and 18(19.4%) *O.savignyi*. Similarly 34(44.2%) of the ticks from Guinea fowl were *A.walkerae*, 20(28.2%) *O.moubata* and 23(32.4%) *O.savignyi*. 5(45.5%) of the ticks from Pigeon were *A.persicus*, 4(36.4%) were *A.walkerae*, 2(18.2%) were *O.moubata* and no *O.savignyi*.



**Figure 2:** Bar graph showing different tick species found on birds' species sold in Gwagwalada market



**Figure 3:** Bar graph showing the locations of tick infestation on the domestic birds sold at Gwagwalada market

Study on the location of tick from the hosts body showed that 53(29.3%) were found around the thighs and breasts, 19(10.5%) around the vent and 100(55.2%) were found under the wings and only 9(5.0%) were on the head & neck. The birds were more infected by *A.walkerae* specie of ticks and the ticks infects more under the wings.

**Discussion**

The result of the analysis showed evidence of tick's infestation on three different types of birds (Domestic fowl, Guinea fowl, Pigeon) sold at Gwagwalada market with more prevalence in domestic fowl then Guinea fowl and Pigeons. The birds were more infected by *A.walkerae* specie of ticks and the ticks infects more under the wings.

Higher infestation of ticks on domestic fowl may be attributed to their non-predatory attitudes towards the parasites as they were known to feed mostly on seeds and even though they feed on insects they do not feed on ticks. Another hypothetical explanation may be due to their indiscriminate roaming about for food which usually made the ticks to have easy access to them and also due to their environment. This finding tends to agree with previous findings from Oluyemi and Roberts (2002) and Biu *et al.*, (2007).

Lower infestation of ticks on pigeon could be related to their predatory behavior against the ticks. Pigeon were observed to be constantly picking their feathers, thereby depopulating the ectoparasites present on their bodies. This fact agreed with the report by NYTS (1999). Also, lower infestation of guinea fowls and pigeon by the ticks may be as a result of their habitation. Guinea fowls and pigeons have been known for their preference to climbing trees on which they sleep rather than in their cages or rooms. This tends to reduce their contact with the ectoparasites. Presence of ectoparasites on pigeons sold in the Gwagwalada market may be related to their breeding habit; they are usually mix-bred with either chickens or guinea fowls, even rabbit hence, there is chance of cross infestation of ticks.

The study revealed higher prevalence of *Argas walkerae* than the other species. This is in line with the report by Biu *et al.*, (2007). They are one of the most important ectoparasites of poultry in semi-arid and arid regions, in which Gwagwalada is located. However, difference in prevalence between *Argas walkerae* and other species may either be coincidental or as a result of adaptability to the semi-arid conditions.

According to the results, body parts of the hosts most commonly affected were wings, vent and breast regions. This may be due to low distribution of feathers, thus easily invaded by the ectoparasites. This also agreed with the findings of Biu *et al.*, (2007). On the other hand, the absence of ticks on neck/head and vent (cloacae) region of some of the birds species may be tied to the presence of high feather cover on the neck and that the areas are not soft and fleshy like the other parts, thus, tissue fluid and blood may not be as available as in the three parts affected.

The result of this research work has revealed that Gwagwalada market poultry section is endemic in terms of ectoparasites (ticks) infestation. Domestic fowls have been found as the most affected and that *Argas walkerae* was the most prevalent species,

mostly located under the wings. This showed that ticks (ectoparasite) in birds or any animals is mostly found on areas with little or no hairs, fleshy muscles and feather to get their nutrition requirement. Ticks have the potential to cause harm in a number of ways, from the physical effects of their bite to the numerous diseases they are able to transmit. There is therefore the need for control of ticks such as improved management and sanitation of the poultry cages in the market, frequent use of both chemical and phytotherapeutic (Acharicidal) insecticides among others.

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### Cite this article as:

Ayoh Stephen O. and Olanrewaju Comfort A. A Survey on Tick Infestation in Domestic Birds Sold at Gwagwalada Market, Abuja, FCT, Nigeria. *International Journal of Bioassays* 5.4 (2016): 4974-4976.

Source of support: Nil

Conflict of interest: None Declared