

SURVEY OF LICE INFESTING DOMESTIC FOWL ON THE JOS PLATEAU, NORTHERN NIGERIA

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SUMMARY

A survey of the prevalence and abundance of species of lice infesting the domestic fowl together with the extent of disease associated with them was undertaken between November, 1969 and June 1972.

All the 400 fowl examined were infested with *Menacanthus cornutus*, 95% with *Gonicotes gallinae*, 90% with *Numidilipeurus tropicalis*, 85% with *Amyrsidea powelli*, 76% with *Goniodes gigas* 46% with *Lipeurus caponis* and 30% with *Cuclotogaster occidentalis*.

High numbers were frequently attained by *M. cornutus* and occasionally by *A. powelli*, *G. gallinae* and *N. tropicalis*.

M. cornutus mainly and to a lesser extent *A. powelli*, *G. gallinae* and *N. tropicalis* were responsible for disease condition and even death in a number of birds particularly in backyard flocks and commercial flocks kept semi-intensively or intensively during the hottest part of the year which in the area occurs in the later part of the dry season in February to April or May.

INTRODUCTION

Little information is available regarding the occurrence of lice on fowls in Nigeria. The few investigations recorded have been confined to Ibadan town, Southern Nigeria and on relatively few birds and for short duration (Caswell 1959; Shoyinka and Libby 1967; Adne and Dipeolu 1975).

During routine diagnosis evidence has been obtained by the author which suggested that chicken lice were a cause of some economic losses to the expanding poultry industry on the Jos Plateau, Northern Nigeria.

The present investigation was carried out to provide further information on the extent of the disease associated with lice and to ascertain the species involved in this area in order to assess the need and feasibility for embarking on control measures.

MATERIALS AND METHODS

Four hundred birds were examined in the course of the investigation which extended from November 1969 to June 1972. One hundred and fifty of these formed part of the 180 chickens whose helminths have been reported elsewhere (Fabiyyi, 1972). Of the remainder, 50 were received for treatment of ectoparasites and 98 received by the Diagnostic Unit of this Institute to establish the cause of death (only those received within a few hours after death were examined). The remaining 102 were bought locally between December 1971 and June 1972 for further helminthological and other parasitological studies. The fowl belonged to various age groups and were obtained from various management systems.

None of the chickens had a history of recent treatment against ectoparasites.

Lice were collected from the plucked feathers and skin in the case of slaughtered or dead birds. Fowl for ecto-

parasite treatment were dusted with Louse Powder* and left for a few hours for the lice to die. They were then 'combed' thoroughly to dislodge the lice they harboured. In the case of dead birds lice were collected within one hour or so of death, so that they had not left the host before removal. The lice were fixed in 70% alcohol and identified microscopically following their clearing in 10% caustic potash or lactophenol or polyvinyl alcohol. Identification was based on the keys drawn up by Emerson (1956) and Matsudaire and Kaneko (1969). Species which could not be identified by these keys were identified by the British Museum (Natural History) at the initial stage of the survey.

Special note was taken of prevalence, intensity of infestation and the general condition of the birds was also noted.

RESULTS

Data on the species and prevalence of lice encountered are given in Table 1.

Table 1. Prevalence and abundance of lice on chickens on the Jos Plateau, Northern Nigeria.

Species	Percentage of birds infested	Rough Estimated range of lice
<i>Menacanthus cornutus</i>	100	36-102,200
<i>Gonicotes gallinae</i>	95	24-72,080
<i>Numidilipeurus tropicalis</i>	90	6-19,040
<i>Amyrsidea powelli</i>	85	25-35,060
<i>Gonicotes gigas</i>	76	8-154
<i>Lipeurus caponis</i>	48	8-65
<i>Cuclotogaster occidentalis</i>	30	3-52

*Sevin = Carbaryl (1-naphyl-methylcarbamate), Union Carbide Corp.

All the 400 birds examined harboured one or more species of lice. Multiple infestations of individual birds with two or more lice species were common, the most frequently occurring combinations being 3 to 5.

From the data in Table 1, it can be seen that *Menacanthus cornutus* (chicken body louse), *Amyrsidea powelli* (bush fowl body louse), *Gonicotes gallinae* (chicken fluff louse) and *Numidilipeurus tropicalis* (the tropical head louse), were common while *Goniodes gigas* (chicken large body louse), and *Lipeurus caponis* (chicken wing louse), were fairly common and *Cuclotogaster occidentalis* (bush fowl head louse) was relatively rare.

It is only possible to form a very rough estimate of number of lice recovered from most birds.

Data relating to the ranges of lice so estimated are expressed in Table 1 column 3. These have been further analysed in Table 2. Levels that may be considered as high (in the region of 10,000 lice and higher) were frequently attained by *M. cornutus* and occasionally by *A. powelli*, *G. gallinae* and *N. tropicalis*.

These four species were also the species most frequently associated with disease conditions in the survey. This was especially the case in semi-intensively and intensively reared stock kept as backyard stock or commercial farms and during the hot dry season period February — April or May when mean maximum temperatures commonly ranged between 28 and 32°C and mean minimum between 18 and 22°C in the area. The free-running birds were little affected clinically.

N. cornutus was apparently the primary cause of clinical severe disease in

Table 2. Distribution of burdens of lice in 400 domestic fowl on the Jos Plateau, Northern Nigeria.

Species of lice	Total No. of birds Infested	Number of fowl infested with				
		1-100	101-500	501-1000	10001-10,000	Over 10,000
<i>Menacanthus Cornutus</i>	400	141	101	70	48	40
<i>Gonicotes gallinae</i>	380	162	103	74	29	12
<i>Numidilipeurus tropicalis</i>	360	230	72	42	11	5
<i>Amyrsidea powelli</i>	340	163	78	51	33	15
<i>Goniodes gigas</i>	304	286	18	0	0	0
<i>Lipeurus caponis</i>	192	192	0	0	0	0
<i>Cuclotogaster occidentalis</i>	120	120	0	0	0	0

up to 50 fowls and death in 12 others. Heavily infested fowls were weak, emaciated, and had reddened scabby skin in the absence or very low infestations with any other disease agents. Out of the 50 fowls clinically affected were about 40 fowls among those brought for ectoparasite treatment. The original emaciation, somnolence and reddened scabby skin lesions disappeared a few days following delousing with louse powder.

A. powelli was considered clinically important in 18 fowls. Of these 16 carried almost pure heavy infestations of this parasite while the remaining 2 birds also carried heavy infestations of *M. cornutus*. Infestation with *A. powelli* was intimately associated with somnolence, emaciation, reddened scabby skin just as with *cornutus*.

N. tropicalis was considered to be primarily responsible for serious pathogenic effects in up to 8 birds. The disease occasioned by this louse was characterised by weakness and droopiness.

G. gallinae was considered responsible for or contributed to severe weakness and emaciation in up to 13 chickens.

DISCUSSION

It would appear, as indicated by this survey, that the role of lice in causing losses may not be negligible in this area just as in U.S.A. (Bishopp 1942).

This is especially so in the more confined semi-intensive and intensive systems now being adopted in the area. It is less of a problem in the free-running unconfined birds probably as a result of unlimited opportunity for sandbathing and anting. Shoyinka and Libby (1967), too observed low infestations in free running and unconfined birds at Ibadan.

The situation recorded in the present survey is in all probability also the case in many other areas of Northern Nigeria (Fabiya, unpublished data). When greater care obtains in diagnosis it may be found that these lice are causing many obscure types of emaciation in chickens and are responsible for much unthriftiness in growers and mature birds (after feathers are well formed) especially in backyard and farm flocks. Attention should thus be paid to the control of the infestations.

In this survey and in outbreaks previously observed, clinical cases due to

chicken lice were commonly encountered during the hot dry season of February — April or May in the area. Presumably the hot weather causes rapid multiplication at this time. Application of treatment particularly before the hot season starts will be very useful. It is to be noted that while a tendency for lice to increase during the hot season has also been observed by some other workers such as Neumann (1892) and Kalamarz (1963) and outbreaks recorded also during this time (Reid and Linkfied 1957) other authors notably Seddon (1958) and Benbrook (1959) have referred to increase intimately associated with cold weather, who thus recommend application of control before the onset of the cold weather.

Considering now the causative agents, it is of interest that while losses due to chicken lice are commonly caused by *Menacanthus stramineus* and *Cuocolto-gaster heterographus* in most parts of the world (Bishop 1942; Roberts 1952), in the present survey losses were due primarily to *M. cornutus* and to some extent *A. powelli*, *N. tropicalis* and *G. gallinae*. However, the involvement in the case of *M. cornutus* is not peculiar to this area, the species having been associated with similar conditions in Georgia, U.S.A. (Reid and Linkfied 1957) and in Khartoum and Wad Medani in Sudan (Yagi, 1963), all having several aspects of climatic conditions similar to those prevailing in Northern Nigeria.

The possible role of *N. tropicalis* in contributing to ill-health has not been previously ascertained but it can be expected that it will be pathogenic when it occurs in high numbers as in the present survey from its feeding habit on the skin (Arora and Chopra 1957), thereby effective in causing irritation,

and consequently emaciation etc., resulting from restlessness.

Possibly, *N. tropicalis* attains pathogenic importance at times in many other parts of the tropics. In many parts of this geographic zone, such as Sri Lanka (Seneviratna 1967), and Panama Canal Zone (Peters 1935), this species is generally the predominant head louse; in other parts such as Bahama Islands (Peters 1931) and Southern Nigeria (Caswell 1959; Fabiyi unpublished data) it is apparently even the only head louse species, the other species including *C. heterographus* so prevalent and abundant in temperate and cold climates (Roberts 1952; Bishopp 1942) being completely absent.

The record of *A. powelli* during this survey represents a new pathogen for chickens. Until this survey started in 1969 this parasite was known only from the bushfowl (Francolins) of several species including Swainson's red-necked francolin, red-billed noisy francolin and crowned francolin from South Africa (Bedford 1920, 1929, 1932) and from Angola red-necked francolin from South West Africa (Bedford 1929, 1932).

The finding of abundant *G. gallinae* in this study parallels only few records in the literature, such as in New South Wales, Australia (Seddon 1958). Although a common parasite, this louse is generally recorded in low numbers and relatively unimportant in the production of disease in many parts of the world (Bishopp 1942, Roberts 1952). The conditions under which it occurs in high numbers remains unknown and requires investigation. This will be of interest since when present in large numbers not only does it affect birds deleteriously by direct action but may also readily transmit avian spirochaetosis (Seddon 1958), a highly fatal poultry disease of widespread occurrence in

Nigeria (Macfie and Johnston 1914, Anon 1957). This role may be particularly so in the more humid southern parts of Nigeria where the fowl tick *Argas persicus*, the only other known possible transmitter of the disease is absent (Caswell 1959, Adene and Dipeolu 1975, Fabiyi unpublished data).

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REFERENCES

- Adene, D.F. and Dipeolu, O.O. (1975). *Bull. Anim. Hlth. Prod. Afr.* 23: 333.
- Anon, (1957). *Ann. Rep. Vet. Serv. Northern Nigeria for 1956-57* p. 15.
- Arora, G.L. and Chopra, N.P. (1957). Some observations on the biology of *Lipeurus tropicalis* Peters (Mallophaga: Insectera). *Research Bull Punjab University*, pp. 485.
- Bedford, G.A.H. (1920). *7th and 8th Rep. Div. Vet. Serv. Un. S. Afr.* 708.
- Bedford, G.A.H. (1929). *15th Rep. Div. Vet. Serv. Un. S. Afr.* 501.
- Bedford, G.A.H. (1932). *18th Rep. Div. Vet. Serv. Anim. Ind. Un. S. Afr.* 223.
- Benbrook, E.A. (1959). External parasites of poultry. In: *Keeping Livestock healthy*. United States Department of Agriculture year book p. 1048.
- Caswell, G.B. (1959). Insects and other arthropods affecting Livestock on the Faculty of Agriculture Division Report No.3 p.21.
- Emerson, K.C. (1956). *J. Kansas ent. Soc.* 29: 63.
- Fabiyi, J.P. (1972). *Bull. Epizoot. Dis. Afr.* 20: 229.
- Kalamarz, E. (1963). *Zeszyt naukowe Wyzej Szkoły rolniczej W. Olsztynie* 16: 457.
- Macfie, J.W.S. and Johnson, J.E.L. (1914). *Ann. Trop. Med. Parasit.* 8: 41.
- Matsuidaira, Y. and Kaneko, K. (1969). *Sanit. Zool.* 20: 219.
- Neumann, L.G. (1892). *Treatise on parasites and parasitic diseases of domesticated animals*. (Translated by George Fleming) London, Bailliere, Tindall and Cox.
- Peters, H.S. (1931). *Ent. News.* 42: 195.
- Peters, H.S. (1935). *Ohio J. Sci.* 35: 101.
- Reid, W.M. and Linkfield, R.L. (1957). *J. Econ. Ent.* 50: 375.
- Roberts, F.H.S. (1952). *Inserts affecting Livestock with special reference to important species occurring in Australia*. Angus & Robertson, Sydney & London.
- Seddon, H. R. (1958). *Diseases of domestic animals in Australia. Part 2. Fly, louse and flea infestations (Veterinary Hygiene) No.6*. Service Publication. Dept. Health Commonwealth of Australia Canberra, A.C.T.
- Seneviratna, P. (1967). *Ceylon vet. J.* 11: 53-56.
- Shoyinka, S.A. and Libby, J.L. (1967). *Nigerian ent. Magazine* 1: 40.
- Yagi, A.I. (1963). *Sudan J. Vet. Sci. Anim. Husb.* 4: 1.

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