

RESEARCH NOTE

THE DISTRIBUTION OF LICE (PHTHIRAPTERA) ON POUTRY
(*GALLUS DOMESTICUS*)

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Abstract—TRIVEDI, M. C., KAWAT, B. C. and SAXENA, A. K. 1991. The distribution of lice (Phtthiraptera) on poultry (*Gallus domesticus*). *Indian Journal of Parasitology* 23: 249-258. The distribution of three amblyopod (*Menacanthus stramineus*, *Menacanthus cornutus*, *Menacanthus pallidus*) and five isosiphon species (*Licentia loricata*, *Licentia cornuta*, *Goniodontes pallidus*, *Goniodontes guineensis*, *Goniodontes*) on poultry was determined. The preferred sites of these species on the host body were noted.

INDEX KEY WORDS: Avian lice, Phtthiraptera, Mallophaga, Amblyopoda, Isosiphona, poultry lice, *Menacanthus*, *Licentia*, *Goniodontes*, *Goniodontes*, *Goniodontes*.

Many workers have provided information relating to the distribution of avian lice on the body of hosts. Amerz (1963) recorded the quantitative and qualitative distribution of five species of Mallophaga on the body of three breeds of hen (Leghorn, Sussex and Braconza). Meisner & Murray (1973) determined the distribution of four species of Mallophaga in the domestic pigeons (*Columba livia*) and Agarwal & Saxena (1978) gave an account of the distribution of poultry lice, *Licentia loricata*, *Licentia cornuta*, *Menacanthus stramineus*, *Menacanthus cornutus* and *Menacanthus pallidus* on the body of poultry. Recently, Chandra, Agarwal & Saxena (1989) listed information on the distribution of four species of Mallophaga occurring on the common guinea fowl (*Scotopelia scabra*). In the present paper an attempt has been made to study the distribution of five amblyopod species, viz. *Menacanthus stramineus*, *Menacanthus cornutus* and *Menacanthus pallidus* (Menoponidae) and five isosiphon species, *Licentia loricata*, *Licentia cornuta*, *Goniodontes pallidus*, *Goniodontes guineensis* and *Goniodontes* (Tenuipoda) on the body of poultry of Dehradun.

Twenty-five heavily infested birds were obtained from different localities at Dehradun. They were kept live in the laboratory in bamboo baskets. Efforts were made to anaesthetize the entire population of lice undisturbed and without allowing any time for movement from one area to another. Paperling was first placed under the wings and then spread around the body to check any movement. A pad of cotton wool, soaked with chloroform or ether, was immediately placed around the body of

each bird. A specially annealed lid on top of the cage was kept in a separate plastic bag and kept in a cool, dry place. Some of the distended lice were aseptically killed by crushing them in a pestle and mortar. The host body was divided into nine regions, viz. head, eye, neck, breast, abdomen and wing and legs. Louse was carefully plucked from these regions and kept in separate glass jars. Each feather was removed individually and its ectoparasites removed and placed in 70% alcohol. After the removal of feathers, the bird was carefully examined with the help of a hand lens and the lice found attached were collected with a fine brush. Lice, the ectoparasites were separated on the basis of species and their distribution. The abundance of each species found on the host was determined for each region and the grand total was determined to determine the percentage abundance of lice on the host. Some lice normally fed from the body while separating the feathers. They were counted separately counted in the grand total but not included in the regional distribution.

Of the 25 birds examined, 12 were infested by three spp., 11 by four spp. and one each by two and five spp. of lice, respectively. The three amblyopod spp., viz. *M. stramineus*, *M. cornutus* and *M. pallidus*, showed a wider range of distribution and preferred mainly the back, breast and abdominal areas (Table 1). *M. stramineus* especially occurred around the dorsal region. This species infiltrated others in the skin, scratches and wounds. Around the feather closed region the skin was visibly inflamed. Among isosiphonera, *L. loricata*, *L. cornuta* and *G. pallidus* showed a wider range of distribution. *L. loricata* and *L. cornuta* mainly occupied the neck and chest while *G. pallidus* preferred the back, abdomen and breast (Table 1). *L.*

TABLE I.—DISTRIBUTION (%) OF INFESTATIONS OF EIGHT SPECIES OF PHTHIRAPTERA ON THE BODY OF 25 POULTRY

Region	<i>Menacanthus stramineus</i> (11)	<i>Menacanthus cornutus</i> (15)	<i>Menopon gallinae</i> (18)	<i>Liparus laurensis tropialis</i> (6)	<i>Liparus caponis</i> (11)	<i>Goniodes dissimilis</i> (8)	<i>Goniodes gregus</i> (5)	<i>Gonietes gallinae</i> (12)	Mean infestation (25)
Head	0	0	0	3	0	0	0	1	0
Nape	0	4	3	26	6	0	0	2	4
Neck	4	3	5	27	24	6	9	2	5
Back	20	30	20	12	3	50	54	26	24
Breast	18	30	26	12	3	18	18	15	16
Abdomen	44	10	27	2	0	0	0	11	7
Tail	3	5	4	1	30	0	0	11	8
Wings	0	6	3	17	33	0	0	2	2
Legs	4	2	1	0	0	7	0	5	8
Miscellaneous	7	9	10	0	1	7	0	5	8

Note: Number of hosts infested with different species are shown in parentheses. Results have been rounded to nearest 1%.

caponis mainly occurred on wings and tail and also on neck feathers. *G. dissimilis* as well as *G. gregus* showed narrow and almost similar patterns of distribution, being especially abundant on the back and to a lesser extent on the breast and the abdomen. An examination of Table I indicates that the back is a preferred site for most phthirapteran infestations.

The data showed that in cases of multiple amblycercan infestation, *M. stramineus* is more concentrated on the abdomen than *M. gallinae* and *M. cornutus*. In the absence of *M. stramineus*, *M. gallinae* is more abundant on the abdomen than *M. cornutus* which normally prefers the back and breast. The size of infestation rarely affects the distribution of amblycercans, but in the case of ischnocercans, especially *L. laurensis tropialis* and *G. gallinae* (which show a wide range of distribution in heavy infestations), the distribution in light infestations becomes narrower to more preferred sites. The distribution of other ischnocercans seems to remain unaffected by the size of infestation as well as the presence of other species.

Clay (1957) cited examples of morphological adaptations in one group of bird lice, Ischnocera (Phthirapteridae); different morphological types occupy different ecological areas on the body of host birds. According to her, short, round-bodied types are found on the shorter feathers of the head and neck, where they cannot be crushed during preening. On the back and wings flat-bodied lice are found which can slip sideways across the feathers. On the other hand, amblycercans are not so diverse in form, and their specialized areas of infestation are not as clear. These forms apparently rely on their greater speed to protect themselves from the preening process. However, Marshall (1981), while discussing the distribution of lice on the body of birds, divided the body of birds into four major areas: (1) head and neck, (2) body, (3) back, (4) wings and tail. To these four major areas of birds, he added two more specialized niches: firstly, the Pigeonid sp. (Amblycera) which lives in the gular pouch of *Pouterus* sp. and secondly, certain members

of Menoponidae (Amblycera) which live within quills of primary and secondary wing feathers.

The pattern of distribution of poultry lice in general conforms to the basic pattern described by Clay (1957) and Marshall (1981) and also resembles the pattern of lice distribution on pigeons (Nelson & Murray, 1971), the vultures (Agarwal, 1982, abstract cited above) and the common Myna (Chandra *et al.*, 1989). As expected, the amblycercan species (*Menacanthus stramineus*, *M. cornutus* and *M. gallinae*) display a wide range of distribution on the body of poultry. The ischnocercan lice, *G. gallinae* and *L. laurensis tropialis*, also exhibit a wide range of distribution in heavy infestations. *L. laurensis tropialis*, the long, thin, slender form, occurs mostly on the nape, neck and head in addition to the back, breast and wings. *L. caponis* mostly prefers wings, tail, neck and also the back and breast. For *G. gallinae*, the small flat-bodied form may be found on any part of the body when in abundance. On the other hand, for *G. dissimilis* and *G. gregus*, the big round-bodied sluggish forms have quite a restricted distribution and occur mostly on the back, breast and abdomen and to a lesser extent on the neck. The distribution of *M. gallinae*, *M. stramineus*, *G. gallinae* and *G. dissimilis* on the body of poultry corresponds to a certain extent with the account given by Kalamatz (1963), but his account of the distribution of *L. caponis* was based on very few lice. In the present study *L. caponis* was found on the wings, tail, neck, nape, back and breast in order of decreasing frequency. The distribution of *M. cornutus* and *G. gregus* is given here for the first time.

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