

EVALUATION OF INSECTICIDES IN THERAPEUTIC MANAGEMENT OF POULTRY PEDICULOSIS IN DIFFERENT SECTORS

Sagarika Mishra^{1*}, Ridhhi Pednekar² and Mukulesh Gatne³

Department of Veterinary Parasitology, Bombay Veterinary College, Mumbai,
Maharashtra-400012, India

Present address: ¹Assistant Project Officer, Odisha Poultry Federation, ²Assistant Professor,
Veterinary Parasitology, ³Head of the Department, Professor

E-mails: sagarikamishra2021@gmail.com (*Corresponding Author)
²riddhi.pednekar@gmail.com, ³mrgatne@yahoo.mail

Abstract: Owing to scanty information available in the literature about the treatment of poultry lice in India, commonly used insecticides and effect of lice on poultry production the present study carried out. Two insecticides deltamethrin and cypermethrin were tested to treat poultry birds. Efficacy of Deltamethrin and Cypermethrin treatment in the form of spray showed 100% efficacy as all the treated WLH and Aseel birds were found negative for lice after the treatment.

Keywords: Poultry, Lice, Prevalence, Insecticidal treatment, Mumbai

INTRODUCTION

Like all other animals, poultry too suffer from a wide range of maladies and ectoparasitic infestation is one of them. The effects of louse parasitism on birds are often severe, including retarded growth, low egg production and susceptibility to other infections. Poultry lice are flightless, oviparous, obligate parasites that spend their whole life on their host. All poultry lice have chewing mouthparts and feed on dry skin scales, scab tissues, and feather parts. They also feed on blood when the bird's skin and feather quills are punctured. The ectoparasites causes irritation, interfere with the feed consumption and thus they are associated with emaciation, anaemia and eventually loss of production (Soulsby, 1982). Most of these are cosmopolitan and, apparently, highly adaptive for various geographic regions and climatic conditions (Sychra *et al.* 2008).

In India, prevalence rate of phthirapteran ectoparasites on Indian birds is not well documented (Chandra *et al.*, 1990, Singh, 1999). So there is only scarce information available on the prevalence of lice infestation and the deleterious effects caused by these ectoparasites on the health of poultry.

MATERIALS AND METHODS

Collection of the lice: The lice from body of birds were collected with help of the blunt plastic forceps in the glass vials containing 30% alcohol and labeled properly. The louse was detached carefully to avoid decapitation and bottled with a label denoting the identity of the host, centre of collection, site of infestation, intensity at that site, date of collection and sample number. The specimens were brought to the laboratory for further identification. The specimen from each bottle were processed systematically for preparation of permanent mounts as per the method described by Soulsby (1982), i.e. dehydration, clearing and mounting .

Processing of lice for preparation of Permanent mount: The lice collected in 30% alcohol were further dehydrated using ascending grades of alcohols starting from 50%, 70%, 90% and absolute alcohol. In each grade of alcohol the specimen was kept for 20 minutes, followed by clearing with clove oil for 30 minutes. After clearing, each specimen was carefully taken on a glass slide and mounted with DPX. The slide was allowed to dry and solidify which took approximately 4 to 5 days.

Identification of lice: The lice were identified by the key given by Sen and Fletcher (1967).

Insecticidal application on avian lice: This part of the study is conducted in CPDO, Mumbai. The infested poultry flocks were treated with either deltamethrin or cypermethrin. The untreated flock served as control.

The insecticide solutions were prepared just before the application by applying 20 ml of commercially available deltamethrin in 5000 ml of water and 20 ml of commercially cypermethrin in 5000 ml of to achieve concentration of 0.4 % of active ingredients. Poultry pens showing heavy lice infestation were selected for the treatment. Aseel and WLH pens showed heavy infestation and were therefore treated with two different insecticidal solutions to study their efficacy. The pen housing Aseel birds had eight compartments, each compartment having 18 birds. Out of which, four compartments were treated with deltamethrin and the other were kept as control. In case of WLH pen, there were five compartments each housing 35 birds. Out of the five compartments two were treated with cypermethrin and the remaining three were kept as control. The insecticidal solution sprayed on the body of each bird, wall of the poultry house and on the litter material with the help of insecticidal sprayer which is showed in Fig 1 . Before the application of the insecticide, the feeder and waterer were removed from the poultry houses so as to prevent chance of toxicity. The birds were observed carefully to note side effects, if any.



Fig 1. Insecticidal application on avian lice

Statistical analysis: Pearson's chi-square test (χ^2) was used to evaluate the association of different variables with the prevalence of ectoparasitic infestation and the data were analyzed by following IBM SPSS Statistics Microsoft version 16 for windows. P-value less than 0.05 (at 5% level of significance) were considered significant in all analysis.

RESULT AND DISCUSSION

Efficacy of insecticides: A trial was conducted to study the efficacy of the two commonly used insecticide i.e. deltamethrin and cypermethrin. All the birds were randomly inspected on 2nd, 4th, 7th day and a month after the application of the insecticide for the presence of any surviving mallophages. All the birds were found to be free from parasitic infestations for about a month. Therefore the results from the present experiment demonstrated in Fig 2 and Fig 3 that the insecticide compounds cypermethrin and deltamethrin when applied at specific concentrations, were 100 % effective against biting lice on chickens. The fact that all medications were applied only once and that there were no infected chickens up to the 30th day post treatment, These findings are in accordance with the findings of Prelezov *et al* (2013) from Bulgaria. Taking into consideration that the embryonic development of Mallophaga, from the time of egg laying to the hatching of the larvae lasts 4 to 8 days as well as the fact that the biological cycle of chewing lice is completed within 2– 3 weeks, it could be stated that the single treatment with the two insecticides tested in the present experiment stops entirely the invasion of chewing lice. The literature on treatment of lice infestation is scanty barring few exception of textbooks (Soulsby,1982 and Bhatia *et al*,2007).



Fig 2. White leg horn before treatment Fig 3. White leg horn after treatment

CONCLUSION

The above study conducted to generate a basic data on treatment and economic aspect of poultry lice from Mumbai region and insecticidal trial suggests that when the insecticidal compound (cypermethrin and deltamethrin) was used at specific concentration it was 100 % effective in elimination of the Mallophagan lice. Though Cypermethrin and Deltamethrin are 100 % effective against lice of poultry in present study , it will be more effective for long term ectoparasitic control under intensive management system. A combinatorial and rotational approach along with better managerial practices should be followed in order to reduce the economic losses due to ectoparasite burden.

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