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Effect of malathion and deltamethrin on natural infestation of lice and red mites of *desi* fowl of Himachal Pradesh

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Abstract

Ectoparasites are one of the major causes of production losses in poultry. Therefore, treatment with various synthetic and herbal ectoparasiticides is often required to enhance the production and to maintain the birds in good health. The present study was planned to evaluate the efficacy of two commonly used insecticides viz. malathion and deltamethrin, formulated as spray against natural infestation of lice and red mites in indigenous *desi* fowl. Malathion was used @ 0.05%, 0.1% and 0.25% and deltamethrin @ of 12.5 ppm, 25 ppm and 37.5 ppm, respectively, The results showed that malathion after application @ 0.25% as spray was effective against lice and red mites of desi fowl as it showed 92.42 per cent reduction in total ectoparasite counts. Deltamethrin after application @ 25ppm and 37.5 ppm, as spray, was highly effective against the lice and mites as these doses resulted in 96.29 and 96.96 per cent reduction in total ectoparasite counts, respectively.

Key words: Ectoparasites, lice, mite, poultry, malathion, deltamethrin, *desi* fowl.

Introduction

Backyard poultry farming is an important component of the economy of the people of Himachal Pradesh as it is a good source of income for the rural people of the state and poultry meat is a readily available source of animal protein for them especially during the harsh winters. Ectoparasites of desi fowl particularly lice and red mites are a major cause of production losses. Therefore, treatment with various synthetic and herbal ectoparasiticides is often required to enhance the production and to maintain the birds in good health. There are a number of reports on the evaluation of the efficacy of various chemical/ synthetic and plant extracts against ectoparasites of poultry (Levot, 1991; Levot, 1993; Hinkle and Hickle, 1999; Szczypel, *et al.*, 2000; Khan, *et al.* ,2003 and Magdas, *et al.*, 2008). The present study was planned to evaluate the efficacy of commonly used insecticides viz. malathion and deltamethrin at different dose rates, as perusal of literature indicated meager information on their efficacy against the natural infestation of lice and red mites of indigenous desi fowl of Himachal Pradesh.

Materials and Methods

The study consisted of two different trials on 2 different flocks of desi fowl maintained at the poultry unit of the Department of Animal Genetics, Breeding and Biostatistics, DGCN College of Veterinary and Animal Sciences, Palampur. The birds were procured from backyard poultry rearers, kept on standard diet and were maintained under deep litter system of poultry rearing. The birds were naturally infested with lice and mites.

The species of ectoparasites were identified. The birds were grouped into 3 different groups comprising of 18 birds each, and a control comprising of 6 birds which were kept in different rooms. In the first trial, efficacy of malathion, formulated as a spray, @ 0.05%, 0.1% and 0.25% was evaluated. The effect of treatment was estimated by counting the ectoparasites in 5 cm^2 area under the wings and neck region before treatment i.e. day 0 and then on day 1, 7, 14 and 21 post treatment. However, ectoparasitic infestation on the entire body of the birds was monitored to know the effect of spraying. In the second trial, efficacy of deltamethrin (formulated as a spray) @ 12.5 ppm (0.0125mg/ml), 25 ppm (0.025mg/ml) and 37.5 ppm (0.0375mg/ml) was evaluated on the birds grouped into 3 different groups comprising of 12 birds each and a control of 6 birds. The effect of treatment was estimated by counting the ectoparasites in 5 cm^2 area under the wings and neck region before treatment i.e.

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day 0 and then on day 1, 7, 14 and 21 post treatment. The per cent efficacy of these two chemicals against natural infestation with lice and red mites was computed based on initial counts of ectoparasites. Per cent control was evaluated and graded with scores 1, 2, 3, 4, 5 for the percentage control of <50, 50-65, 65-80, 80-95 and >95, respectively. The scores were added to express the total efficacy score (TES), enabling the easy comparison of the two ectoparasiticides used in varied concentrations (Muraleedharan *et al.*, 2006).

Results and Discussion

In the present study, a mixed infestation with lice and mites was recorded. The various species of ectoparasites recorded from desi fowl were *Menopon gallinae, Menacanthus stramineus, Lipeurus caponis and Dermanyssus gallinae.* Similarly, Chadda *et al.* (2005) have reported *Menacanthus stramineus, Lipeurus caponis, Goniocotes gallinae* and *Ornithonyssus bursa* from the backyard poultry of Kangra district of Himachal Pradesh. Lakshmanan *et al.* (2007) have reported *Menacanthus stramineus* and *Menopon gallinae* from Wayanad, Kerala. However, Goel *et al.* (2005) have reported *Menacanthus cornutus, M. stramineus, Lipeurus lawrensis, Goniocotes gallinae, Goniodes dissimilis* from district Meerut, U.P. The results of trial 1 and trial 2 have been depicted in Table 1.

Table 1. Efficacy of deltamethrin and malathion against lice and mites of *desi* fowl

	Conc.	No. of birds	Mean ectoparasite count*					Score				TES
			Day 0	Day 1	Day 7	Day 14	Day 21	Day 1	Day 7	Day 14	Day 21	
Trial 1												
Malathion	0.25%	18	11	1.33 (92.42)	1.25 (88.63)	1.16 (89.39)	3.33 (73.48)	4	4	4	3	15
	0.1%	18	7.16	3.16 (50.70)	3.0 (53.52)	3.5 (46.47)	3.5 (45.07)	2	2	1	1	6
	0.05%	18	12.33	12.83	11.5	11.16	14	-	-	-	-	
Control	-	6	11.33	11.16	10.83	10.83	12.16					
Trial 2												
Deltamethrin	12.5 ppm	12	11.16	0.75 (92.74)	0.5 (95.16)	0.83 (91.93)	2.25 (78.22)	4	5	4	3	16
	25 ppm	12	8.08	0.33 (96.29)	0.25 (97.22)	0.08 (99.07)	0.91 (89.81)	5	5	5	4	19
	37.5 ppm	12	11.0	0.33 (96.96)	0.16 (98.48)	0.08 (98.48)	0.83 (92.42)	5	5	5	4	19
Control	-	6	11.66	9.53	9.83	11.66	9.33					

*Values in parentheses indicate per cent reduction in total ectoparasite count

The results showed that malathion @ 0.25% as spray was effective against lice and red mites of desi fowl as it showed 92.42 per cent reduction in total ectoparasite counts and had TES of 15. The per cent reduction in total ectoparasite counts @ 0.1% was recorded to be 50.70 only. However, 0.05% concentration of malathion was not able to eliminate the ectoparasites from the fowl. (Table 1). The finding of Levot, (1991) is in corroboration with present findings as he has reported that Maldison -50 (malathion) @ 0.25% was found to be effective against *Dermanyssus gallinae* and *Ornithonyssus bursa* of poultry. However, Naqvi *et.al* (1993) have reported 0.1% concentration of malathion to be effective against bed bugs in poultry houses. In the second trial, it was found that deltamethrin @ 37.5 ppm and 25 ppm, as spray was highly effective against lice and mites of the desi fowl as these dose rates resulted in 96.29 and 96.96 per cent reduction in total ectoparasite count, on day 1, respectively, with TES of 19 (Table 1). However, the dose rates of 12.5 ppm resulted in 92.74% reduction in total ectoparasite count with TES of 16. The dose

rate of 37.5 ppm was quite effective with residual effect even upto day 21 post treatment. However, Frolov and Chirikashvili (1994) have reported deltamethrin @0.001-0.003% effective against mites of fowl. Taha (2004) reported 0.1% deltamethrin as dip effective against *Dermanyssus gallinae* in poultry. D'Souza *et al.* (2001) found deltamethrin to be effective in the control of feather mite of poultry. Misra *et al.* (1996) have reported 50-100 ppm of deltamethrin in diet to be toxic for the birds of 8 weeks. In the present study, no signs of toxicity were observed when malathion and deltamethrin were used at the dose rates as mentioned above in the present trials. As per the TES score it could be concluded that deltamethrin was more effective against ectoparasites of fowl as compared to malathion.

References

Chaddha Deepali, Agnihotri RK and Katoch R 2005. Incidence of ectoparasites in poultry in Palam valley of Himachal Pradesh. J. Vety.Parasitol. **19**:57-58.

D'Souza PE, Murthy KMS and Jagannath MS 2001. Feather mite infestation in a broiler breeder farm. Vety. Record. **149**:777.

Frolov BA and Chirikashvili RV 1994. Efficacy of K-otrin against ticks and insects ectoparasites of birds. Prob-Veterinarnoi-Sanitari-i-Ekologii. **93**:28-38.

Goel S, Rastogi R and Singh HS 2005. Prevalence, intensity and rate of infestations of phthirapteran parasites on poultry bird, *Gallus gallus domesticus*. Uttar Pradesh J. Zool. **25**:157-62.

Hinkle NC and Hickle LA 1999. California caged layer pest management evaluation. J. Appl. Poultry Res. **8**: 327-38.

Khan MN, Naqeem, M, Zafar I, Sajid MS and Abbas RZ 2002. Lice infestations in poultry. Intl. J. Agri. Bio. **5**:213-16.

Lakshmanan B, Ravindran R and Subramanian H 2007. Lice infestation in domestic birds of Wayand, Kerala. Indian J. Poultry Sci. **42**:343-44.

Levot GW 1991. Chemical control of *Dermanyssus gallinae* (Acarina: Dermanyssidae) on caged layer hens.Gen. and App. Entomo. **23**:49-52.

Levot GW 1993. Control of northern fowl mite, *Ornithonyssus sylviarum* infestations on commercial poultry. Gen. App. Entomol. **24**:3-10.

Madgas C, Briciu R, and Cozma V 2008. *In vitro* effect of some synthetic acaricide and plant extracts against *Dermanyssus gallinae*. Revista Romana de Medicina Veterinara **18**:155-62.

Muraleedharan K, Murthy HKS, Sahadev A, Gopinathan N and Paramsivia, BM 2006. Field trials on Sumicidin and butox against natural infestation of common ectoparasites of cattle, sheep and goats. J. Vety. Parasitol. **20**:145-48.

Misra S, Sharma LD, Ahmad AH 1996. Experimental deltamethrin toxicity in poultry (*Gallus domesticus*). Ind.J. Vety. Med. **16**:40-45.

Naqvi SNH, Tabassum R, Nurulain SM and Khan MF 1993. Comparative toxicity of RB-a (neem formulation) and malathion against bed bugs. Proc. Pakistan Cong. Zool. **13**:369-77.

Szczypel B, Larramendy R and Hernandez M 2003. Evaluation of different insecticides against external parasites of hens. Revista Cubana de Ciencia Avicola **27**:121-24.

Taha EA and Abu–el-Azm KI 2004. Trials for mite control in laying poultry flock. Vety. Med. J. Giza. **52**:107-14.