

## Review

# Lice Infestation in Poultry

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### ABSTRACT

This paper reviews the studies on the prevalence, chemotherapeutic and biological control of lice. It was found that *Menacanthus stramineus*, *Menopon gallinae*, *Goniodes gigas*, *Goniocotes gallinae*, *Lipeurus lawrensis tropicalis*, *Lipeurus caponis* and *Cuclotogaster heterographus* were the most commonly infesting lice of poultry. A variety of chemical are used for the control of lice infestation in poultry. These include Carbamates, Pyrethroids, Cypermethrin, Trichlorphon, Dichlorvos, DDT powder, Coumaphos, Lindane and BHC, Phenol, Cresols, Permethrin, Pestoban, Malathion, Pflspray, Carbaryl, Methyl bromfenvinphos and Herbal products. The most promising results however were reported with Pyrethroids i.e. Trichlorphon and Pestoban. Biological control although not widely accepted for application, yet some bacterial and fungal species were found to be effective. Based on the review conclusion have been drawn for further research in to the lice infestation of poultry.

**Key Words:** Lice; Poultry

### INTRODUCTION

Poultry is an economic and effective source of animal protein within the shortest possible time, playing a vital role in narrowing down the animal protein supply gap. Poultry can easily be infected with several types of bacterial, viral, fungal and parasitic pathogens (Soulsby, 1982). Among various parasitic diseases, ectoparasites infestation are of great importance. Ectoparasites of poultry live on the skin or penetrate within the skin or even in to the air sacs and some live under the feathers. These ectoparasites consume dead cells of skin and tissue fluids, while other suck blood (Phillip, 1963; Urquhart, 1987). Lice is an important ectoparasite of poultry which cause ill health in poultry and cause heavy morbidity by sucking blood and causing irritation to the birds, which adversely affects the economical production of poultry (Edgar & King, 1950). The birds reduce haemoglobin and erythrocyte values and hyperchromic anaemia (Jungmann, 1970). Lice infestation causes weight loss at the rate of about 711 gms per birds and decrease the egg yield at the rate of about 66 egg per bird in a year (El-Kifl *et al.*, 1973) and lameness is associated with heavy lice infestation (Okaeme, 1989). The purpose of this paper is to review the studies on lice infestation in poultry and associated risks.

**Prevalence.** There are a number of a species of lice infesting poultry. These include *Menacanthus stramineus* (Hohorst, 1939; Erlich, 1942; Giles & Raun, 1959; Stockdale, 1960; Knapp, 1962; Hoffman & Hogan, 1967; Hoffman & Gingrich, 1968; Brown, 1970; Iqbal *et al.*, 1971; Mathysse, 1972; Mathur, 1973; Martin, 1973; Kumar & Sahai, 1974; Puchkova, 1977; Kachekova & Frolov, 1978; Shafique, 1979; Horning *et al.*, 1980; Reddy *et al.*, 1980; Grzywinski *et al.*, 1980; Zlotorzycska, 1980; Devi & Mishra, 1981; Mehl, 1981; Urban & Zlotorzycska, 1981;

Cariaso, 1982; Modrzejewska, 1982; Zlotorzycska *et al.*, 1982; Panda & Akluwali, 1983; Fedorenko *et al.*, 1983; Hofstad, 1984; Frolov *et al.*, 1984; Reddy *et al.*, 1985; Ratanasethakul *et al.*, 1985; Morrow, 1986; Ugochukwu & Omije, 1986; De-Vaney, 1986; Ahmed, 1986; Bilinski & Jankowska, 1987; Chandra *et al.*, 1988; Okaeme, 1989; Salisch, 1989; Pavlovic *et al.*, 1989; Werner *et al.*, 1989; Noh, Y. T *et al.*, 1989; Ahmad, 1991; George *et al.*, 1992; Chhabra & Donoru, 1994; Shahjehan & Iqbal, 1995; Zhang-Deling *et al.*, 1996; Amin-Babjee *et al.*, 1997; Axtell, 1999; Rafiq, 2000), *Menacanthus cornutus* (Hohorst, 1939; Hohorst, 1942; Erlich, 1942; Mathysse, 1972; El-Kifl *et al.*, 1973; Martin-Mateo *et al.*, 1980; Fabiyi, 1980; Hofstad, 1984; Reddy *et al.*, 1985; Morrow, 1986; Abdul-Karim *et al.*, 1988), *Menacanthus pallidulus* (Hohorst, 1939; Mathysse, 1972; Martin, 1973; Manuel & Anceno, 1981; Hofstad, 1984; Sinha *et al.*, 1989; Noh, Y.T *et al.*, 1989) *Menacanthus cornutum* (Hohorst, 1939; Mathysse, 1972; Martin-Mateo *et al.*, 1980; Fedorenko *et al.*, 1983) *Menacanthus numidae* (Mathysse, 1972; Martin, 1973; Martin-Mateo *et al.*, 1980; Fedorenko *et al.*, 1983), *Cuclotogaster heterographus* (Mathysse, 1972; Kumar & Sahi, 1974; Martin-Mateo *et al.*, 1980; Hofstad, 1984; Reddy *et al.*, 1985; Ahmed, 1986; Morrow, 1986; Shahjehan & Iqbal, 1995; Amin-Babjee *et al.*, 1997), *Cuclotogaster occidentalis* (Fabiyyi, 1980; Martin-Mateo *et al.*, 1980; Mehl, 1981; Modrzejewska, 1982; Fedorenko *et al.*, 1983), *Columbicola colombae* (Hathaway, 1943; Hashmi, 1971; El-Kifl *et al.*, 1973; Mathur, 1973; Singh & Chhabra, 1973; Tigin, 1973; Agarwal & Saxena, 1981; Devi & Mishra, 1981; Mehl, 1981; Dikaev, 1988; Kaminjolo *et al.*, 1988; Noh, Y.T *et al.*, 1989), *Lipeurus lawrensis tropicalis* (Mathysse, 1972; Mathur, 1973; Kumar & Sahai, 1974; Martin-Mateo *et al.*, 1980; Fabiyi, 1980; Zlotorzycska, 1982; Agarwal & Saxena, 1981; Buriro, 1982; Panda &

Akluwali, 1983; Hofstad, 1984; Reddy *et al.*, 1985; Okaeme, 1989; Noh, Y.T *et al.*, 1989), *Lipeurus caponis* (Hohorst, 1939; Erlich, 1942; Hoffman & Hogan, 1967; Hoffman & Gingrich, 1968; Iqbal *et al.*, 1971; Mathysse, 1972; Kumar & Sahai, 1974; Shafique, 1979; Fabiyi, 1980; Devi & Mishra, 1981; Manuel & Anceno, 1981; Buriro, 1982; Hofstad, 1984; Ahmed, 1986; Ugochukwu & Omije, 1986; Okaeme, 1989; Ahmad, 1991; George *et al.*, 1992; Ahmed-Babjee *et al.*, 1997; Islam *et al.*, 1999; Rafiq, 2000), *Lipeurus tropicalis* (Mathur, 1973; Mehl, 1981; Modrzejewska, 1982; Fedorenko *et al.*, 1983; Panda & Akluwali, 1983; Sinha *et al.*, 1989), *Lipeurus heterographus* (Hoyle, 1938; Hohorst, 1939; Martin-Mateo *et al.*, 1980; Mehl, 1981; Modrzejewska, 1982), *Menopon gallinae* (Hoyle, 1938; Erlich, 1942; Hoffman & Hogan, 1967; Hoffman & Gingrich, 1968; Jungmann *et al.*, 1970; Mathysse, 1972; El-Kifl *et al.*, 1973; Martin, 1973; Mathur, 1973; Kumar & Sahai, 1974; Shafique, 1979; Grzywinski *et al.*, 1980; Reddy *et al.*, 1980; Devi & Mishra, 1981; Manuel & Anceno, 1981; Urban & Zlotorzycza, 1981; Buriro, 1982; Cariaso, 1982; Zlotorzycza, 1982; Frolov *et al.*, 1984; Bilqees & Khan, 1985; Ratanasethakul *et al.*, 1985; Ahmad, 1986; Okaeme, 1989; Sinha *et al.*, 1989; Ahmad, 1991; George *et al.*, 1992; Chhabra & Donora, 1994; Sexena *et al.*, 1995; Shahjehan & Iqbal, 1995; Amin-Babjee *et al.*, 1997; Larramendy-R *et al.*, 2000; Rafiq, 2000), *Gonicotes gigas* (Erlich, 1942; Devi & Mishra, 1981; Mahl, 1981; Buriro, 1982; Fedorenko *et al.*, 1983; Frolov *et al.*, 1984; Bilqees & Khan, 1985; Sinha *et al.*, 1989; Shahjehan & Iqbal, 1995) *Gonicotes hologaster* (Hohorst, 1939; Erlich, 1942; Jungmann *et al.*, 1970; Tigin, 1973; Devi & Mishra, 1981; Frolov *et al.*, 1984; Sinha *et al.*, 1989), *Gonicotes gallinae* (Mathysse, 1972; El-Kifl *et al.*, 1973; Mathur, 1973; Ruprah, 1979; Fabiyi, 1980; Grzywinski *et al.*, 1980; Manuel & Anceno, 1981; Devi & Mishra, 1981; Urban & Zlotorzycza, 1981; Zlotorzycza *et al.*, 1982; Hofstad, 1984; Ahmed, 1986; Okaeme, 1989; Chhabra & Donora, 1994; Amin-Babjee *et al.*, 1997), *Gonicotes hidentatus* (Manuel & Anceno, 1981; Buriro, 1982; Fedorenko *et al.*, 1983), *Gonicotes bidentatus* (Tigin, 1973; Singh & Chhabra, 1973; Fedorenko *et al.*, 1983), *Goniodes gigas* (Mathysse, 1972; Mathur, 1973; Kumar & Sahai, 1974; Fabiyi, 1980; Hofstad, 1984; Ratanasethakul *et al.*, 1985; Ugochukwu & Omije, 1986; Okaeme, 1989; Ahmad, 1991; George *et al.*, 1992; Chhabra & Donora, 1994; Amin-Babjee *et al.*, 1997; Rafiq, 2000) *Goniodes dissimilis* (Hohorst, 1939; Mathysse, 1972; Kumar & Sahai, 1974; Fabiyi, 1980; Manuel & Anceno, 1981; Shusmanou, 1982; Fedorenko *et al.*, 1983; Hofstad, 1984; Ratanasethakul *et al.*, 1985; Noh, Y.T *et al.*, 1989; Shahjehan & Iqbal, 1995; Amin-Babjee *et al.*, 1997), *Goniodes pavonis* (Martin-Mateo *et al.*, 1980; Rodriguez *et al.*, 1981; Fedorenko *et al.*, 1983; Okaeme, 1989)

Incidence rates remained distinctly higher on older birds, the intensity of infection remained distinctly higher during the summer months (Saxena *et al.*, 1995). The major out breaks of lice infestation occurred in the hot dry

period of February-May (Fabiyyi, 1980). *L. caponis* infestations were diagnosed in April, July, August, November (Islam *et al.*, 1999). In terms of ectoparasites prevalence, chicken breeds were in order: Harco > Lumacco > Rhode Island Red > Barbrock (Ugochukwu & Omije, 1986). The lice are most prevalent in summer seasons i.e. June, July & August and scarcest from November to February (EL-Kifl *et al.*, 1973). The optimum temperature for the development of *Manacanthus stramineus* is 37.7 – 41.5C (Brown, 1970). *Menacanthus pallidulus*, *Menopon gallinae*, *Goniodes dissimilis* and *Gonicotes gallinae* were most abundant on the back region of the host and *Lipeurus caponis* on the wing feathers (Manuel & Anceno, 1981).

**Chemotherapy.** A number of chemicals and herbal products are used for the control of biting and sucking lice infestation of poultry. Malix, a dusting powder containing derris (Hohorst, 1939). Phenol and Cresols at 2% kill lice (Buxton, 1940). Complete control of *M. stramineus* on hens by treating with 100 mg Coumaphos (Co-Ral) dust per square fut (Knapp, 1962). Lindae and BHC (Ware & Naber, 1962). 5% granules of ronnel, 2% granules of bromophos and 2% dust of Dimetilan highly effective against lice infestation (Hoffman & Hogan, 1967). *B.thuringiensis* (Hoffman & Gingrich, 1968). 2.7% butanate and 0.5% lindane supprey (Jungmann *et al.*, 1970). 2% trichlorphon (Puchkova – EA, 1977). Biollethrin, Biopresmetrin, Neo-pinamin and Pybuthrin were effective in low concentration against *Menacanthus stramineus* (Kachekova & Frolov, 1978). Dichlorvos (Nuvan. 7) effective for lice control (Grzywinski *et al.*, 1980). 0.5-1% solution of Phosalone (Zolone) effective against lice infestation (Reddy *et al.*, 1980). Coumaphos (as Asuntol-50) Malathion, Trichorphan (Neguvon) Pflspray, Permethrin (Coopex) and Carbaryl were highly effective in killing lice (Manuel & Macetangay, 1981). The effectiveness of 5% Methyl bromfenvinphos (Polwet. 5) against the fowl ectoparasite (Zlotorzycza *et al.*, 1982). 2% Aqueous solution of Pestoban (Herbal products) very effective against lice infestation (Ahmed, 1986). Pestoban application at a dolutation at 1:30 was sufficient to control lice infestation (Sinha *et al.*, 1989). Bacilan, Dipel (a commerical preparation of *Bacillus thuringiensis* subsp. *Kurstaki*) *B.thuringiensis* the serotypes *Kurstaki*, *Finitimus*, *Kenya* and *Morrisoni* were most toxic to *M. gallinae* (Lonc *et al.*, 1988). Permethrin (Pavlovic *et al.*, 1989). Pyrethroids are effective against ectoparasites (Salisch, 1989). Vixon (Carbaryl preparation) highly effective against sucking and biting lice (Werner *et al.*, 1989). The Guinea fowl and chicken were successfully treated with DDT powder and the Peahen with Coumaphos (Okaeme, 1989). Cypermethrin (Chhabra & Donora, 1994). A single treatment with Gammatox as 1% dip was effective in controlling *L. caponis* infestation (Islam *et al.*, 1999).

**Biological control.** Three biological products were available in the USSR for ectoparasite control: two of them (Entobakterin and Dendrobacillin) were preparations of spores and endotoxin of *Bacillus thuringiensis* and the third (Boverin) Conidiospores of the Fungus *Beauveria bassiana*. These were active, alone or in combination with chemical pesticides, against lice infestation (Frolov *et al.*, 1974).

## CONCLUSION

In the light of this review it is concluded that further research is to be conducted into the lice infestation because it is a common problem in poultry which causes heavy in poultry by causing damage to the birds and their production.

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