

INTERNATIONAL JOURNAL OF PURE & APPLIED BIOSCIENCE

SEM studies on the terminalia of poultry fluff louse, *Goniocotes gallinae*
(Phthiraptera: Ischnocera)

Surendra Kumar, Aftab Ahmad, Rehmat Ali and A. K. Saxena*

Department of Zoology, Government Raza P.G. College Rampur (U.P.) 244901

*Corresponding Author E-mail: akscsir@rediffmail.com

ABSTRACT

SEM studies on the terminal segment of poultry fluff louse, *Goniocotes gallinae* revealed that in case of males the tip of parameres and mesosomal arch remain protruded out of arc shaped groove of weakly bilobed thickened plate. Sclerite adjacent to the plate is poorly developed. In case of females the posterior straight margin of terminalia bears a depression and the vulval margin bear four pairs of spiniform stout setae.

Keywords: Phthiraptera, Mallophaga, Ischnocera, Poultry fluff louse, *Goniocotes gallinae*.

INTRODUCTION

The nature of abdominal segment bearing genital opening has remained a much debated issue among the phthirapterists. While performing taxonomic studies on the subject several workers have paid attention on the structure. Important studies on the subject have been made by Clay¹, Gustafson², Schmutz⁸, Lyal^{5,6} and Yashizawa¹¹. Workers like Keler³, Ledger⁴, Tendeiro¹⁰ and Smith⁹ have made specific attempt to record the nature of ninth abdominal segment of Gonioididae. Survey of literature indicates that the terminal abdominal segment of poultry fluff louse *Goniocotes gallinae* deserved further study. Present paper deals with the nature of abdominal segment bearing male and female genitalia of the aforesaid louse as revealed under SEM.

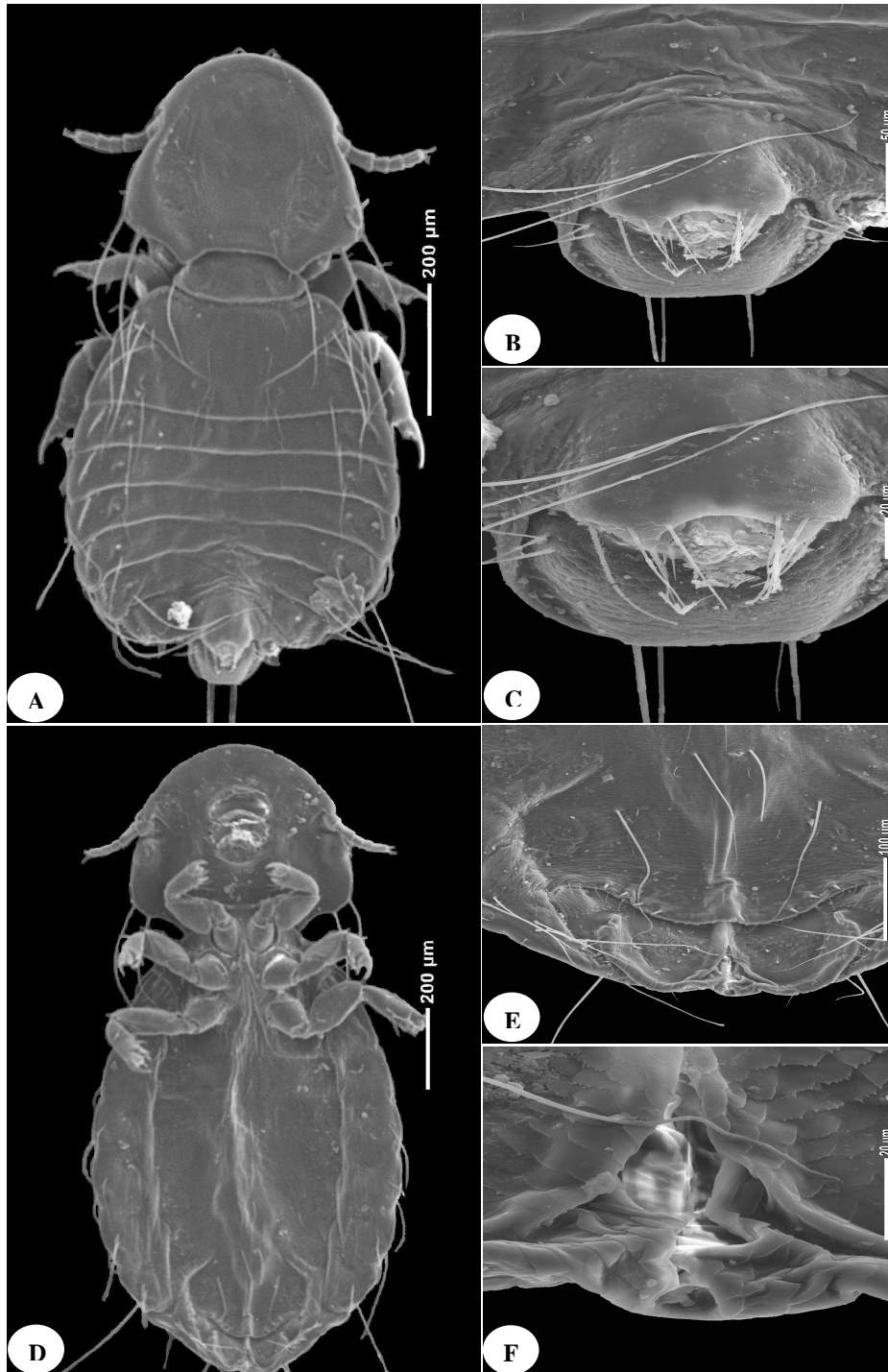
Adult male and females of poultry fluff louse, *Goniocotes gallinae* were collected from career hens from District Rampur, India through survey work. The lice were stored in 70% alcohol, cleaned in distilled water (two changes) and ether (three changes), dehydrated, mounted on metal stub using double sided tape, coated with gold palladium in Neo Coater 100-240V and observed under SEM (Neo JCM-6000). The samples were then observed under SEM at varying magnifications and selected areas were photographed. Some specimens were treated with Osmium tetra oxide (2%) for achieving better results.

RESULTS AND DISCUSSION

In male abdominal segment IX protrudes in form of prominent lobe extending beyond the natural margin of the abdomen (Fig.1A). It is raised in the form of thickened ridges centrally and bears 03 pairs of setae on the lateral most margins and two pairs of large setae on the distal margins. Dorsally, the weakly bilobed plate appears quite thickened and is centrally produced in arc like structure. The dorsal surface of the plate bears three pairs of setae from which the tips of parameres and mesosomal arch of male genitalia protrude outwards (Fig. 1 B,C). The sclerite adjacent to setae bearing plate is poorly developed and produced into cone like structure on either side. The lateral margin of abdominal segment IX are quite prominent.

In females the abdominal segment IX is comparatively short (Fig. 1 D). Its posterior margins are straight ventrally produced in form of W shaped ridge (Fig. 1 E). A distinct depression occurs on the distal margin followed by a ridge (Fig. 1 F). The vulval margins appears to membranous. Its lateral margins bear four spiniform stout setae placed at equal distance. The lateral margins of vulva are devoid of patch of setae. The nature of external genitalia of Gonioididae is quite variable and has been discussed from time to time^{3,4,8,10}. However, Schmutz⁸ has tried to resolve the structural homologies in the matter. Present SEM based report furnished additional information on the nature of the terminal abdominal segment of fluff louse *Gonicotes gallinae*.

Figure 1- A-F. Scanning Electron Micrographs of adult *Gonicotes gallinae*



A. Adult male (X 110), B. Enlarged view of male terminalia (X 450), C. More enlarged view of male terminalia (X 700), D. Adult female (X 75), E. Enlarged view of female terminalia (X 270), F. More enlarged view of female terminalia (X 1500)

Acknowledgment

Authors are thankful to Principal, Government Raza P. G. College, Rampur for laboratory facilities and to University Grants Commission, New Delhi for financial support to Dr. Surendra Kumar in form Major Research Project.

REFERENCES

1. Clay, T. Phthiraptera. In L. Tuxen [ed.], Taxonomist's Glossary of Genitalia in Insects. Ejnar Munksgaard, Copenhagen. 145-148 (1956)
2. Gustafson, J. F. The origin and evolution of the genitalia of the Insecta. *Microentomology*, **15**(2): 35-67 (1950)
3. Keller, S. Baustoffe zu eitner monographie der Mallophagen. II Teil: UberfamilieNirmoidea. *Nova Acta Leopoldina*., 811-254 (1939)
4. Ledger, J.A. Phthiraptera (Insecta). South African Institute for Medical Research, Johannesburg (1980)
5. Lyal, C.H.C. External genitalia of the Psocodea, with particular reference to lice (Phthiraptera). *Zool. Jb. Anat.* **114**: 277-292 (1986)
6. Lyal, C.H.C. Structure and function of the male genitalia of the badger louse , *Trichodectes melis* (Fabricius) (Phthiraptera: Ischnocera: Trichodectidae). *Entomol. Month. Mag.*, **123**: 55-58 (1987)
7. Qadri, M. A. H. Male genitalia of Mallophaga infesting North-Indian birds. *Proc. Ind. Acad. Sci.*, **4**:454-470 (1939)
8. Schmutz, W. Zur Konstruktionsmorphologie des männlichen Geschlechtsapparates der Mallophagen. *Zool. Jb. Anat.*, **74**: 211-316 (1955)
9. Smith, V. S. Basal ischnoceran louse phylogeny (Phthiraptera: Ischnocera: Gonioididae and Heptapsogasteridae). *System. Entomol.*, **25**: 73-94 (2000)
10. Tendeiro, J. Estudos sobre os Gonioidideos (Mallophaga, Ischnocera) dos Columbiformes: género *Physconelloides* Ewing, 1927. Junta de Investigacoes Cientificas do Ultramar. *Estudos, Ensaios E Documentos (Portugal)*., **133**: 1-205 (1980)
11. Yoshizawa, K. and Johnson, K.P. Morphology of male genitalia in lice and their relatives and phylogenetic implications. *System. Entomol.*, **31**: 350-361 (2006)