

Occurrence of *Gonicotes gallinae* (De Geer, 1778) (Phthiraptera: Insecta) on *Gallus sonneratti* Temminck, 1813, Grey Jungle Fowl Bird (Galliformes: Phasianidae) as New Host Record from India

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ABSTRACT: *Gallus sonneratti* Temminck, 1813, Grey jungle fowl bird (Galliformes: Phasianida) is known to harbour four phthirapteran species of lice (two amblyceran louse, *Menacanthus pallidulus*, Neumann, 1912; *Menopon gallinae* Linnaeus, 1758 and two ischnoceran louse, *Goniodes dissimilis* Denny, 1842; *Lipeurus caponis* Linnaeus, 1758). During the present studies another ischnoceran louse, *Gonicotes gallinae* (De Geer, 1778) was recorded as new host record on *G. sonneratti* Temminck, 1813, Grey jungle fowl bird from India.

Keywords: *Gonicotes gallinae*, Lice, New host record, Phthiraptera, *Gallus sonneratti*, India.

INTRODUCTION

The genus *Gonicotes* Burmeister, 1838 contains forty-eight species of Phthiraptera that are ectoparasitic on birds in the Phasianidae family (Price *et al.*, 2003). Workers like (Ahmad *et al.*, 2014; Ansari, 1955; Balwant *et al.*, 2021; Chambless *et al.*, 2022; Clay, 1938; Emerson, 1951, 1956; Emerson and Elbel 1957a, b; Kouam *et al.*, 2022; Khan *et al.*, 2003; Lakshiminarayana, 1971, 1979; Mansur *et al.*, 2019; Nasser *et al.*, 2014; Naz *et al.*, 2011; Onyekachi, 2021; Price and Graham 1997; Saxena *et al.*, 2010; Sychra *et al.*, 2008; Trivedi *et al.*, 1991) have described various species of galliformes birds. Price *et al.* (2003) also reported two ischnoceran species, *Goniodes dissimilis* Denny, 1842, *Lipeurus caponis* (Linnaeus, 1758) and two amblyceran species, *Menacanthus pallidulus* (Neumann, 1912a), *Menopon gallinae* (Linnaeus, 1758) from *Gallus sonneratti* Temminck, 1813 (Galliformes: Phasianida). The presence of *Gonicotes gallinae* (De Geer, 1778) on *Gallus sonneratti* Temminck, 1813,

Grey jungle fowl bird has been documented for the first time as new host record from India.

MATERIAL AND METHODS

Gallus sonneratti Temminck, 1813, Grey jungle fowl bird was trapped alive in the district Gajpati of Odisha state of India in the year 2021. After tying the legs gently, bird was thoroughly searched for the presence of phthirapteran ectoparasites by visual examination with the help of a magnifying lens equipped with a light source. Bird was subjected to delouse by the modified Fair Isle method Gupta *et al.* (2007) after that released in their respective place. The entire louse load was transferred to 75% ethyl alcohol and separated by sex, species, and stage of growth. For the SEM study, lice were fixed in 2.5% gluteraldehyde, post-fixed in 0.25 M phosphate buffer, critical dried, mounted on a metal specimen stub using double-sided black tape, coated with gold palladium in the Neo Coater 100-240V, and observed under SEM (Neo JCM-6000).

Table1: Measurements (mm) of *Gonicotes gallinae* (De Geer, 1778) parasitizing the *Gallus sonneratti* Temminck, 1813, Grey jungle fowl bird.

Characters	Female		Male	
	Length	Width	Length	Width
Head	0.38	0.48	0.28	0.38
Pre-antennal	0.14	0.42	0.10	0.30
Post antennal	0.24	0.48	0.18	0.38
Prothorax	0.08	0.27	0.07	0.22
Pterothorax	0.16	0.41	0.12	0.36
Abdomen	0.75	0.68	0.47	0.53
Total	1.37		0.94	

The samples were then observed under SEM at varying magnifications, and selected areas were photographed. Some specimens were treated with osmium tetroxide (2%) for better results. Measurements are given in millimeters (Table 1).

RESULTS

Female: (Plate-I)

Head with marginal carina moderately developed; antennae filiform; hyaline margin absent, dorsal carina absent and ventral carina banded around the pulvinus, dorsal pre-antennal suture absent, ocular seta minute; marginal temporal carina moderately developed. Pronotum with postero-lateral angle slightly protruded and bearing one thick setae on each side. Pteronotum without any indication of division medially; with two long setae on postero-lateral angle and one normal and small setae on posterior margin each side. Posterior margin of pteronotum curved or distinctly V shaped.

Leg sternocoxal in articulation. Abdominal terga II comparatively larger; terga II-VIII separately medially; IX-X fused and continuous; spiracles present, last tergum with two long and three short to minute setae on each side marginally; vulva small and membranous with 2-3 short spines like each side.

Male: (Plate-II)

Head is long is as broad, nearly quadrate, marginal carina well founded, broader in front, narrow on the sides. Temples strongly angulated with rounded tips. Shape and chaetotaxy of pronotum of male as much as female. Pteronotum bearing two long and three short setae on each posterolateral margin. Terga II-III bearing one long and two short setae and IV to VII one long and one short setae. Pleural plates well developed forming a simple, comma shaped marginal sclerotization. Antennae are simple and do not show sexual dimorphism.



Plate I: SEM photographs of adult female *Goniocotes gallinae* (De Geer, 1778) 1. Habitus dorsal view 2. Enlarged view of head 3. Enlarged view of terminalia.

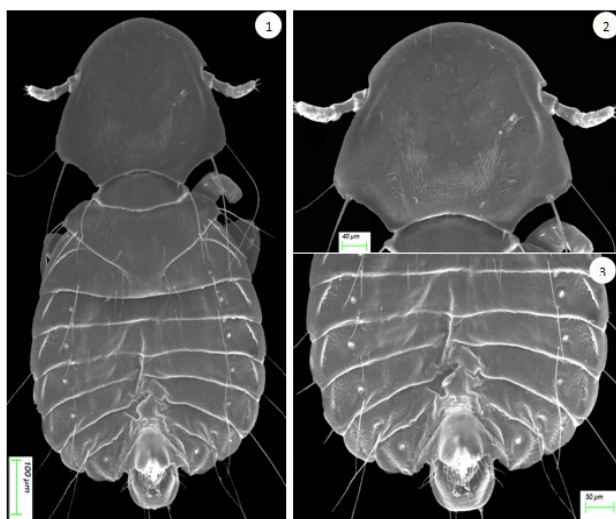


Plate II: SEM photographs of adult male *Goniocotes gallinae* (De Geer, 1778) 1. Habitus dorsal view 2. Enlarged view of head 3. Enlarged view of terminalia.

The males are distinctly smaller than female. Male genitalia short and simple and comprising segments IX-X, Lateral sclerotic plates present on segment X, posterior margin of the last abdominal segments bear six to seven normal and one micro setae medially and two very long setae at laterally.

DISSCUSION

Goniocotes Burmeister, 1838 is closely related to *Goniodes* Nitzsch, 1818 and *Companulotes* Keler, 1939 in having of head margin and body shape, sclerotization on the abdomen, rounded temples, and small size in generic level. *Goniocotes gallinae* (De Geer, 1778) is similar to *G. maculates* in terms of antennal segmentation, female genitalia, body shape, and an anterior head margin, but can be distinguished by the pre-antennal region, antennal structure, the occipital angle, the thorax lateral margin, the IIIrd abdominal segment, the tergopleurites, the vulval margin, and the male genitalia. The members of *Goniocotes* are slightly pigmented and much smaller than *Goniodes* and *Companulotes*. *G. gallinae* can be distinguished from other Mallophagan species by the presence of two long setae on the posterior margin of the head and by the lateral margins of the prothorax being extended (Sanders, 1960). *Goniocotes gallinae* (De Geer, 1778) is found worldwide on birds of the Phasianidae family. It is commonly known as the poultry fluff louse and is usually seen attached to the down or fluff at the base of the feathers or around the vent of the feathers of the hosts, but may occur on feathers on any part of the body. Trivedi *et al.* (1991) found it to be fairly evenly distributed over the host, with 26% on the back, 27% on the abdomen, and lesser numbers on the breast, tail, and wings. Although generally believed to be an economic pest of the Phasianidae family. *G. gallinae* (De Geer, 1778) is usually considered to be less damaging than some of the other haematophagous Phthiraptera (Roberts and Smith 1956; Furman, 1962).

CONCLUSIONS

In the present investigation, an attempt was made to provide information on the presence of *Goniocotes gallinae* (De Geer, 1778) on *Gallus sonneratti* Temminck, 1813, Grey jungle fowl bird along with a description using scanning electron microscopy. The presence of *Goniocotes gallinae* (De Geer, 1778) on *Gallus sonneratti*, Temminck, 1813, Grey jungle fowl bird is reported for the first time as new host record from India.

FUTURE SCOPE

Phthirapteran ectoparasites adversely affect the growth and productivity of the host. Haematophagous phthirapteran species are able to transmitting the pathogens *i.e.* virus and bacteria and also act as intermediate hosts of filarial worms. Therefore, studies the impacts of parasitism on poultry birds is least

investigated and more efforts and studies required to full fill the gap.

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Conflict of Interest. None.

REFERENCES

- Ahmad, A., Gupta, N. and Saxena A. K. (2014). Scanning Electron Microscopy of Antennal Sensilla of *Goniocotes* Species infesting Helmeted Guinea fowl, *Numida meleagris* (Galliformes :Numididae). *Researcher*, 6(4), 7-11.
- Ansari, M. (1955). Synoptic table for the determination of Mallophaga infesting the domestic fowl (*Gallus gallus domesticus*). *Indian J. Entom*, 17, 245-270.
- Balwant, S., Jaya, D. and Sakshi, T. (2021). Diversity and prevalence of ectoparasite on chicken (*Gallus gallus domesticus*) in district Gonda, Uttar Pradesh, India. *International Research Journal of Modernization in Engineering Technology and Science*, 3(7), 106-111.
- Chambless, K. N., Cornell, K. A., Crespo, R., Snyder, W. E. and Owen, J. P. (2022). Diversity and prevalence of ectoparasites on poultry from open environment farms in the western-United States of Washington, Idaho, Oregon, and California. *Journal of Medical Entomology*, 59(5), 1837-1841.
- Clay, T. (1938). Revision of the genera and species of Mallophaga occurring on Gallinaceous hosts. Part I. *Lipeurus* and related genera. *Proc Zool Soc Lon (Series B)*, 108, 109-204.
- Emerson, K. (1951). A list of Mallophaga from Gallinaceous birds of North America. *J Wildlife Manage*, 15, 193-195.
- Emerson, K. C. and Elbel, R. E. (1957a). New records of Mallophaga from wild chickens. *Journal of Parasitology*, 43(3), 381-382.
- Emerson, K. C. and Elbel, R. E. (1957b). New species and records of Mallophaga from gallinaceous birds of Thailand. *Proceedings of the Entomological Society of Washington*, 59(5), 232-243.
- Emerson, K. C. (1956). Mallophaga (chewing lice) occurring on the domestic chicken. *Journal of Kansas Entomological Society*, 29(2), 63-79.
- Furman, D.P. (1962). Poultry insects and related pests, ch. 19. In R.E. Pfadt, ed. *Fundamentals of Applied Entomology*. Macmillan Co, New York.
- Khan, M. N., Nadeem, M., Iqbal, Z., Sajid, M. S. and Abbas, R. Z. (2003). Lice infestation in poultry. *Intern. J. Agri. Biol*, 5, 213-216.
- Kouam, M. K., Fokeng, A. N., Biekop, H. F., Hako Touko, A. B. and Tebug, T. T. (2022). Prevalence (sic) and clinical signs of chewing lice in local chickens (*Gallus gallus domesticus*) in Menoua Division, Western highlands of Cameroon. *Veterinary Parasitology*, 34, 100772.
- Lakshminarayana, K. V. (1979). A synoptic list of Mallophaga sens. lat. (*Phthiraptera*: Insecta) from

- India and adjacent countries together with host and regional indices. *Records of the Zoological Survey of India*, 75, 39-201.
- Lakshminarayana, K. V. and Emerson, K. C. (1971). Mallophaga Indica. VI. Notes on *Goniocotes* (Mallophaga: Philopteridae) found on *Pavo cristatus*, with description of a new species. *Oriental Insects*, 5, 95-102.
- Mansur, K. M., Mahmoud, N. M., Allamoushi, S. M. and El Aziz, M. A. (2019). Biodiversity and prevalence of chewing lice on local poultry. *Journal of Dairy, Veterinary and Animal Research*, 8, 26-31.
- Nasser, M., Al-Ahmed A., Shobrak, M. and Aldryhim, Y. (2014). Identification key for chewing lice (*Phthiraptera*: Amblycera, Ischnocera) infesting the Indian Peafowl (*Pavo cristatus*) with one new country record and new host record for Saudi Arabia. *Turkish Journal of Zoology*, 38.
- Naz, S., Rizvi, S. A. and Akhter, M. A. (2011). Records of chewing lice (*Phthiraptera*) on different birds of Phasianidae (Galliformes) from Sindh-Pakistan. *Pakistan Journal of Entomology Karachi*, 26(2), 153-156.
- Onyekachi, O. (2021). Prevalence of Ectoparasite Infestation of Chicken in three poultry forms in Awka. *Asian Basic and Applied Research Journal*, 3(2): 1-13
- Price, R. D. and Graham, O. H. (1997). Chewing and sucking lice as parasites of mammals and birds. Technical Bulletin Number 1849. *Agric. Res. Serv.*, 1849, 1-257.
- Price, R. D., Hellenenthal, R. A., Palma, R. L., Johnson, K. P. and Clayton, D. H. (2003). The chewing lice: world checklist and biological overview. Illinois Natural History Survey, Special Publication 24. Illinois, USA, 1-500.
- Roberts, I. H. and Smith, C. L. (1956). Poultry lice. In 1956 Yearbook of Agriculture, pp. 490-493. U.S. Department of Agriculture.
- Saxena, A. K., Rashmi, A., Arya, G., Ahmad, A., Bansal, N. and Bhatnagar, S. (2010). Phthirapteran ectoparasites infesting Domestic hens: Current status of information. *Annals of Entomology*, 28(2), 23-33.
- Sychra, O., Harma, P. and Literak, I. (2008). Chewing lice (*Phthiraptera*) on chickens (*Gallus gallus*) from small backyard flocks in the eastern part of the Czech Republic. *Veterinary Parasitology*, 152, 344-348.
- Trivedi, M. C., Rawat, B. S. and Saxena A. K. (1991). The distribution of lice (*Phthiraptera*) on poultry (*Gallus domesticus*). *International Journal of Parasitology*, 21, 247-249.

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