

## Egg shell morphology of an amblyceran louse, *Hohorstiella rampurensis* (Phthiraptera) infesting ring dove, *Streptopelia decaocta*

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**Abstract:** Scanning electron microscopy (SEM) study showed that miniature rice grain like egg shell of *Hohorstiella rampurensis* was covered by obliquely placed opercular disc. The apophyses were present only on one side of the egg shell. There were 25-35 long elongated rod like apophyses (apically turned), which were arranged in 3-4 rows and occurred in pair. The nature of egg shell of *H. rampurensis* characteristically differed from that of *H. lata* (the only species of *Hohorstiella* studied, so far). The study further indicates about the role of egg morphology as a guide to louse taxonomy.

**Keywords:** Amblycera, Egg shell morphology, Lice, Microtopography, Phthiraptera

### INTRODUCTION

The markings/ projections present on the egg cases of Phthiraptera are often species specific and can be used to differentiate the species (Balter, 1968 a, b). Selected workers have made attempts to record the microtopography of certain avian lice with the help of SEM (Bilinski and Jankowska, 1987, Castro *et al.*, 1996, Zawadzka *et al.*, 1997, Saxena *et al.*, 2000, Kumar *et al.*, 2003, 2007, Beg *et al.*, 2004, Gupta *et al.*, 2004, 2009, Rajput *et al.*, 2010). The present report furnishes information on the egg shell morphology of an amblyceran louse, *Hohorstiella rampurensis* infesting ring dove, *Streptopelia decaocta*.

### MATERIALS AND METHODS

Feathers bearing egg of *H. rampurensis* were gently cut from host body and teased out with the help of extremely sharpened entomological pins. Eggs were subjected to Scanning Electron Microscopy (SEM) studies following the method adopted by Gupta *et al.*, (2009).

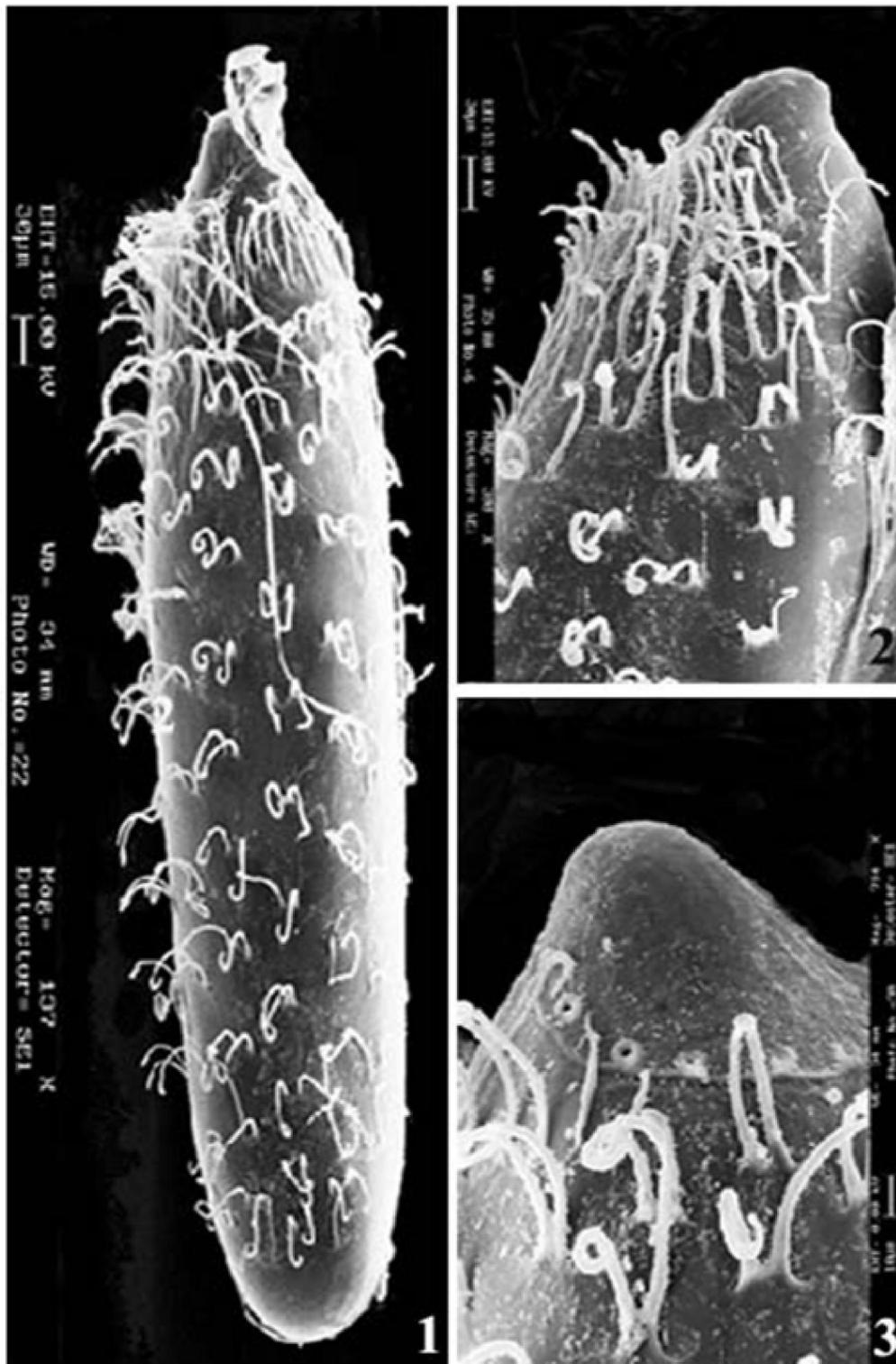
### RESULTS

Eggs of *H. rampurensis* are generally found laid on the feathers belonging to nape, neck and head (fore parts) of the body. This louse lays eggs on the basal portion of the feathers on either side of calamus. Generally 1-2 eggs were observed on feathers. The eggs were glued medio-laterally. Thus, they lay straight and were inclined at 0-5°, with respect to rachis. The egg shells of *H. rampurensis* is a miniature rice grain (measuring 0.74-0.76 mm in length and 0.18-0.19 mm in width) (Plate I, Photo 1) like in appearance. The egg mouth was covered by a conical obliquely placed opercular disc (Plate I, Photo

2). However, the opercular disc was quite smooth and devoid of sculpturing/ polar thread. Twelve to fourteen small button shaped micropyles (7 mm in diameter) were found arranged along the opercular rim (Plate I, Photo 3). The egg chorion was quite smooth but bore numerous apophyses. However, the apophyses were present only on one side of the egg shell (the side which was glued to the feathers remained devoid of apophyses) (Plate II, Photo 1). At the apical end (near egg mouth) there occurred 25-35 long elongated (0.03-0.05 mm long) rod like apophyses (apically turned) which were arranged in three to four rows and occurred in pairs. Rest of the chorion was found studded with small sized apophyses which remained curved (Plate II, Photo 3). These apophyses also occurred in pairs and were more or less equally spaced. However, the basal portion of the egg remained smooth (devoid of apophyses). The rear end of the egg shell carried the stigma in the form of 3 to 4 protuberances (Plate II, Photo 2). Thus, the eggshell of *H. rampurensis* exhibited certain peculiar features which can help in differentiating the species during taxonomic categorization.

### DISCUSSION

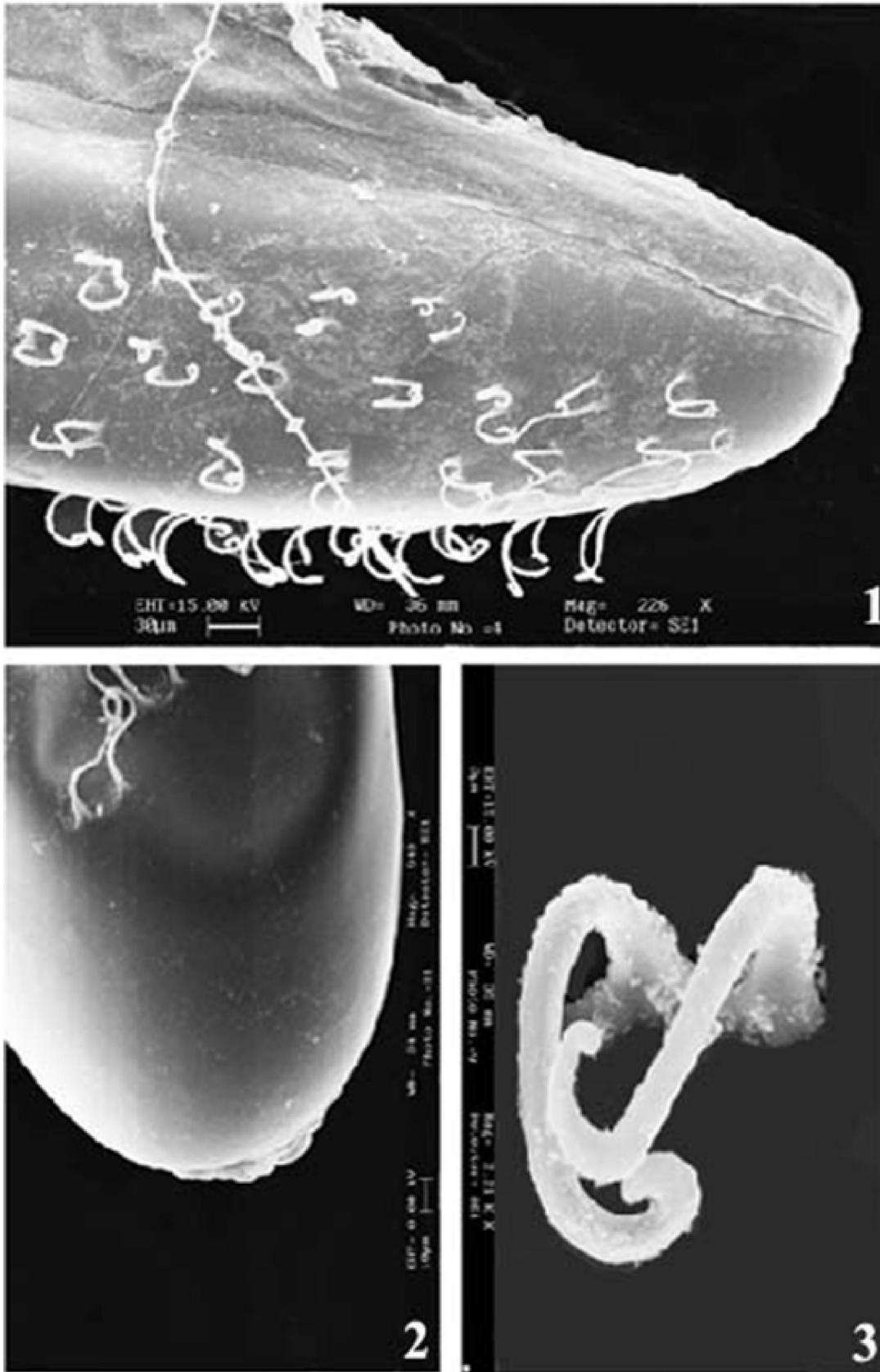
Eggs of avian lice often exhibit markings/ sculpturings which are quite species specific and can be used to differentiate the genera and species. Balter (1968 a, b) have emphasized the role of egg morphology as a guide to louse taxonomy. The nature of egg shells of different species belonging to same genus have been best studied in case of genus *Menacanthus* (e.g. *M. stramineus*, *M. gonophaeus*, *M. cornutus* and *M. abdominalis*) by workers like Balter (1968 a,b), Bilinsky and Jankowska



**Plate 1.** SEM photographs of the eggs of *Hohorstiella rampurensis* showing- 1. Entire eggshell (x137), 2. Enlarged opercular end showing the nature of apophyses (x240), 3. Enlarged view of the opercular end (x315).

(1987), Zadewaka *et al.* (1997), Beg *et al.* (2004), Kumar *et al.* (2007) and Gupta *et al.* (2009). The egg shells of aforesaid species of *Menacanthus* exhibit differences in the nature of apophyses, polar thread, opercular disc and the micropyles. As far as the egg of genus *Hohorstiella* is concerned, only one species (pigeon

louse, *Hohorstiella lata*) has been studied so far (Saxena *et al.*, 2000). The egg shells of *H. lata* bore numerous spine like apophyses which were characteristically different from *H. rampurensis*. In case of *H. rampurensis*, the apophyses were present only on one side of the egg shell. The apophyses of apical region were quite long



**Plate II.** SEM photographs of the eggs of *Hohorstiella rampurensis* showing- 1. Enlarged posterior portion showing nature of apophyses X127, 2. Enlarged rear end showing the nature of stigma X460, 3. Enlarged view of apophyses in the middle region of the egg shell X210.

and apically turned; apophyses occurring on the main egg shell occurred in pairs and remained bent. Moreover, the nature of opercular disc of *H. rampurensis* was also different from that of *H. lata*. The present study further supported the observations of Balter (1968 a) that egg morphology of avian lice can act as guide to louse taxonomy.

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