

**SEM studies on egg architecture of *Lutzia (Metalutzia) fuscana* wiedemann
(Diptera: Culicidae)**

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ABSTRACT

*The present communication deals with the scanning electron microscopic (SEM) studies on the eggs of *Lutzia (Metalutzia) fuscana* Wiedemann. The presence of different types of tubercles at the micropylar region and conical-shaped region have been described and illustrated. SEM studies on the egg of present species have been conducted for the first time.*

Keywords: Diptera, Egg morphology, *Lutzia*, SEM.

INTRODUCTION

Genus *Lutzia* Theobald, 1903 was considered as one of the subgenus of genus *Culex*, including mainly two species i.e. *Culex (Lutzia) fuscans* Wiedemann and *Culex (Lutzia) halifaxii* (Theobald) [1-2]. However, researchers [3] upgraded the status of subgenus *Lutzia* in 2003 to generic level and introduced a new subgenus, *Metalutzia* for the placement of *Lutzia fuscana* & *Lutzia halifaxii*. He also restored the status of *Lutzia vorax* Edwards by removing it from the synonymy of *Lutzia halifaxii* (Theobald).

The present species is not known as a vector for any disease as such and seldom attacks human beings [1]. The females are also known to readily feed on common pigeon i.e. *Columba livia* after dark [4]. The species with reference to its adult female and male along with its larva in detail was described in 1934 [1]. However, the egg of the present species was described for the first time [5] and detailed account of its pupa was given [3]. It is worth to mention here that nobody has studied the ultrastructure of the egg of this species, so far. In order to fill this gap, scanning electron microscopic studies have been conducted on the eggs of *Lutzia fuscana* for the first time. The characters like shape, color, size, presence of different types of papillae at the anterior and posterior ends have been described and illustrated in this communication.

MATERIALS AND METHODS

The eggs of *Lutzia fuscana* used in this study were procured from adult females of the species under reference collected from different districts of Punjab. The species was identified following the keys of [1]. The adult mosquitoes obtained from the field, laid eggs in the laboratory. Eggs were immediately removed from filter paper by using paintbrush. For SEM studies, protocol given by other researchers [6] was followed. Eggs were preserved in Bouin's solution taken in vials for one hour and preserved eggs dehydrated in different graded series of ethanol starting from 30% - 100% and mounted on SEM specimen stubs using only a small strip of double sided adhesive tape. The samples were then sputter coated with gold and scanned under Jeol-JSM-6100 SEM with acceleration voltage of 10 kV at Panjab University, Chandigarh. Micrographs of 10-20 eggs were examined for detailed observations. The terminology for naming various structures was followed from the works of other researchers [7-8].

OBSERVATIONS

The eggs were laid in rafts on the surface of water; brownish in color; sub-fusiform in shape, bluntly rounded at anterior end and more pointed at posterior end. They have micropylar region and conical- shaped region, the later is further categorized into anterior, middle and posterior regions. The size of eggs was 749- 752 μm in length and 151- 154 μm width at the broadest point and dehiscence incomplete (Fig. 1A).

Egg of *Lutzia (Metalutzia) fuscana* Wiedemann

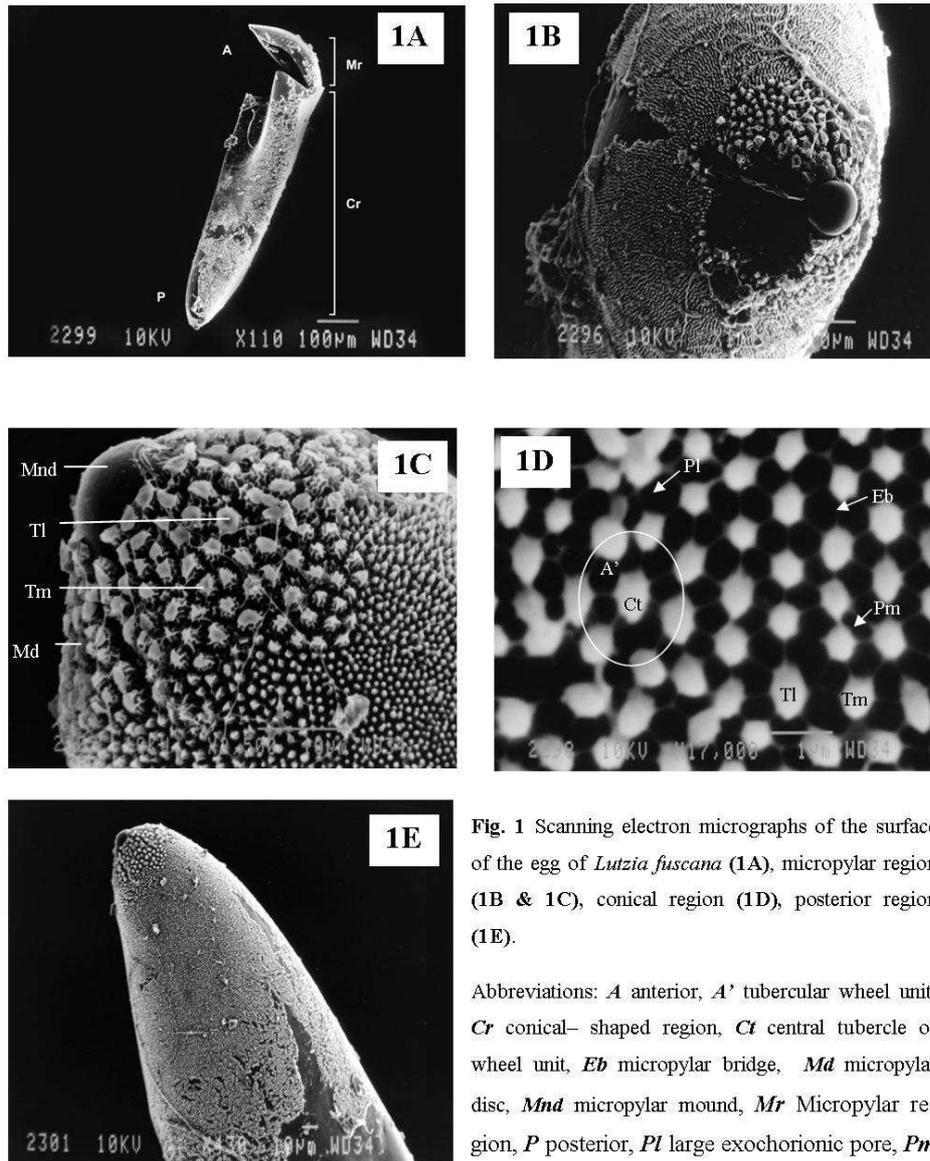


Fig. 1 Scanning electron micrographs of the surface of the egg of *Lutzia fuscana* (1A), micropylar region (1B & 1C), conical region (1D), posterior region (1E).

Abbreviations: *A* anterior, *A'* tubercular wheel unit, *Cr* conical- shaped region, *Ct* central tubercle of wheel unit, *Eb* micropylar bridge, *Md* micropylar disc, *Mnd* micropylar mound, *Mr* Micropylar region, *P* posterior, *Pl* large exochorionic pore, *Pm* medium exochorionic pore, *Tl* large tubercle, *Tm* medium tubercle

The micropylar region of the egg of this species is divisible into corolla, micropylar pore, micropylar disc, micropylar mound and various size of tubercles directed towards downwards from micropylar disc. The tubercles are pentagonal or polygonal with many processes and of large and medium size. Corolla is frequently lost after hatching of egg. Micropylar mound length is 12.31µm and its width 6.15 µm. (Fig. 1B &1C).

The tubercles of conical- shaped region differ from that of micropylar region in their shape. They are hexagonal in shape and of large (Tl) and medium (Tm) size in anterior, middle and posterior regions. Exochorionic pores of conical- shaped region of egg are quadrangular and pentagonal in shape. They are of large (Pl) and medium (Pm) size in all the three regions of conical- shaped region. The tubercle wheel unit comprises of tubercles, exochorionic pores and bridges. The diameter of the wheel unit in the middle and posterior region of egg are 2.76 µm and 2.6 µm (Fig. D). The posterior end of egg is pointed having same arrangement of tubercles (Fig. E).

DISCUSSION

Three distinguishing features of the egg of *Lutzia fuscana* Wiedemann i.e. the absence of reticulation in the chorion (only faint striations visible), the presence of dark minute papillae at anterior & posterior ends and the restriction of darker pigmentation at the anterior & posterior ends were described [5]. All these features have been observed in the present work also. The surface morphology and morphometrics of mosquito eggs are helpful to a greater extent many times in taxonomic identification [9-10]. The superficial morphology of eggs of different species of *Culex* has been described by several workers [8,11-16]. The eggs of *Lt. fuscana* have many features common with the usual characteristics of eggs of genus *Culex* e.g., subfusiform in shape, light brown color, areas of pigmentation confined to the anterior and posterior polar specialized areas, presence of micropylar mound, larger tubercle around micropylar region. However, significant differences have been observed in this work i.e. shape of tubercles at the micropylar region which are either pentagonal or polygonal with many processes. The shape of the tubercles in the conical shaped region is also different i.e. hexagonal, connecting each other through exochorionic bridges having pentagonal or hexagonal pores. All these attributes have been described for the first time. Reporting of these new attributes/features on egg morphology of *Lutzia fuscana* will certainly update the existing taxonomic information and strengthen the detailed diagnosis of the present species.

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