

## Scanning electron microscopic (SEM) studies on egg architecture of *Armigeres* (*Armigeres*) *Subalbatus* (Coquillett)

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### ABSTRACT

The egg surface structures of *Armigeres* (*Armigeres*) *subalbatus* (Coquillett) have been studied and illustrated with the aid of Scanning Electron Microscope (SEM). Many new taxonomic features have come to light, which have been discussed in detail.

**Keywords:** Scanning Electron Microscope (SEM), egg, micropyle, micropylar disc, *Armigeres subalbatus*.

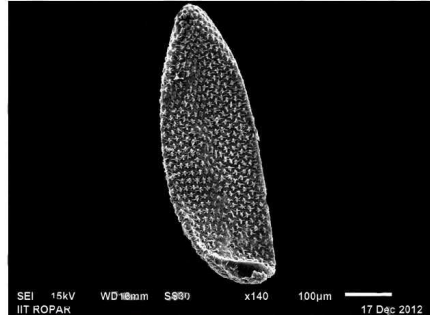
### INTRODUCTION

The role of various immature stages in the identification of different species of mosquitoes is enormous. Many taxonomists have explored new characteristics on immature stages of family Culicidae in order to strengthen the diagnosis of various taxa. Description of eggs with help of SEM has proved useful to distinguish the closely related species such as *Anopheles quadrimaculatus* complex [1] *Haemogogus* species [2] and Toxorhynchytes [3]. A lot of work has been on the various species of genus *Armigeres* by [4], Basio and Basio [5-20]. The larval stages of *Armigeres subalbatus* were studied by [21]. The life history of *Armigeres subalbatus* was described by [22]. Morphology of egg of above said species done by [11], described only the egg morphology and [10], gave the structure of tubercles. However, no such studies have been conducted on *Armigeres* (*Armigeres*) *subalbatus* (Coquillett) with the aid of SEM. During the recent collection-cum-survey tours a good number of representatives were collected from different localities of Punjab state. The species has also been reared in laboratory.

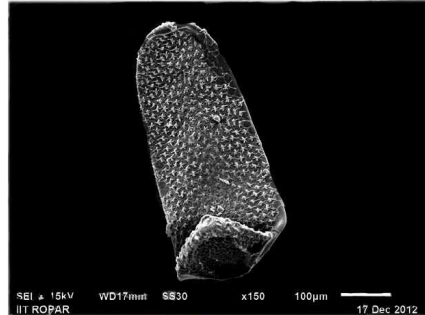
### MATERIALS AND METHODS

Adult mosquitoes were procured with the help of oral aspirators, test tubes, torch and insect collecting nets from gardens, cattle sheds, hay stacks, nurseries and human dwellings. The egg of above said species laid by blood fed females collected from different districts of Punjab. For the identification of species keys given by [3], [24], [25], [26] and [27] and terminology given [28] and for SEM studies protocol given by [29] was followed. Immediately after the oviposition eggs were removed and placed on the filter paper by using paint brush. Eggs were dehydrated in a series of ascending grades of alcohol. The material was placed on stubs in dorsal position after air drying on filter paper. Then coated with gold and images were observed under JSM-6610LV Scanning Electron Microscope. The eggs were photographed at different magnification for viewing dorsal, ventral and lateral positions, anterior and posterior ends.

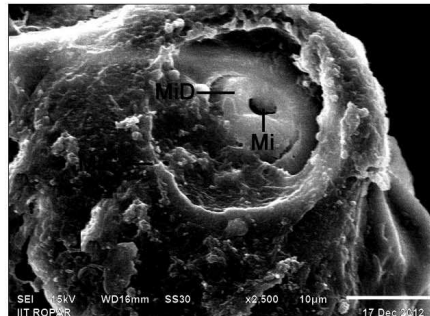
**Egg of  
*Armigeres (Armigeres) subalbatus* (Coquillett)**



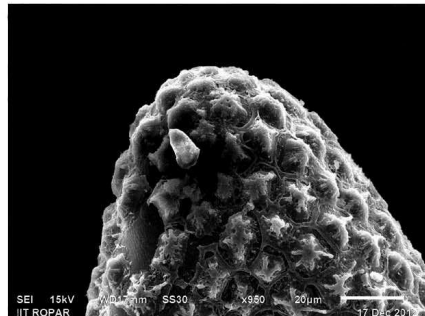
**Fig. 1 Whole Egg (Lateral view)**



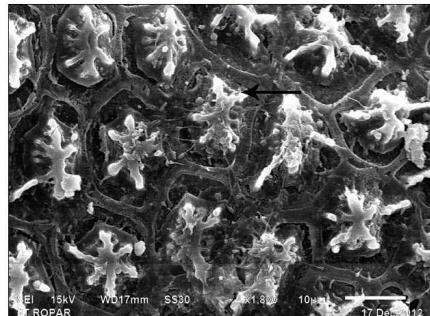
**Fig. 2 Dorsal view**



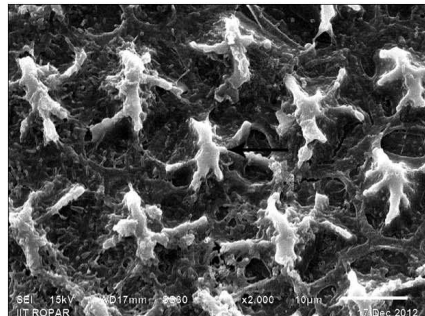
**Fig. 3 Micropylar Region**



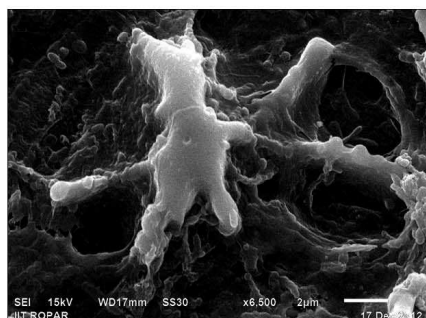
**Fig. 4 Posterior End**



**Fig. 5 Dorsal Tubercles**



**Fig. 6 Ventral Tubercles**



**Fig. 7 Magnified Tubercle**

## RESULTS AND DISCUSSION

**General appearance:** Eggs elongated, shiny black overall in color and laid singly. Dehiscence takes place by means of a curious U-shaped slit. Sterile eggs, like those of *Aedes* species tends to split longitudinally [11].

**Anterior pole:** It is furnished with micropylar apparatus (Fig.3). Micropyle located centrally by micropylar disc (Fig.3) separating from other structures by a groove. Further surrounded by prominent micropylar collar having rounded margins. Ring of collar continuous.

**Posterior pole:** It is rounded, gradually tapering as compared to anterior end. Size of tubercles smaller towards posterior pole (Fig.4).

**Dorsal view:** According to [10] ridges (chorionic cells) of this species form a roughly quadrilateral to hexagonal shape. But in the present study, the ornamentation of chorionic cells hexagonal but sometimes pentagonal also (Fig.7). A large central tubercle having a regular outline, forming a meshwork like structure. Tubercles of two types: larger ones confined to central region and smaller ones to edges (Fig.2, 3 & 5). Tubercles give a smooth appearance; provide function of maintaining the adhesion of eggs to substrate.

**Ventral view:** Except at anterior and posterior pole, the predominantly hexagonal outer chorionic cells are more or less uniform in size (Fig.6).

## CONCLUSION

By recording morphological characteristics of the eggs of each species, it may be possible to construct keys for identifying mosquito eggs. Description of mosquito eggs based on SEM can aid species identification and can be used for immature habitat studies being particularly relevant for medically important species. Several species of *Armigeres* are suspected of transmitting *Wuchereria bancrofti*. The species *Armigeres subalbatus* is closely resembles to *Armigeres kuchingensis*. Morphologically, minor differences help to differentiate both these species. So, the present study helps to differentiate both species in its immature stage. The characters like micropyle, micropylar disc, anterior and posterior poles, dorsal, ventral and lateral sides of eggs are studied in detail in the present work.

## Abbreviations

Mi (Micropyle) and Micropyle Disc (MiD).

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