

FINE STRUCTURE COMPARISON OF EGGSHELL FROM *LUCILIA SERICATA* AND *CALLIPHORA VICINA*, CALLIPHORIDAE WITH FORENSIC IMPORTANCE

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Introduction

In forensic investigations, eggs of blowflies are very commonly found and can become essential for a proper identification of sarcosaprophagous Diptera. However, most of the time they cannot be used as entomological evidence since they are morphologically very similar and have not been studied in detail.

Material and Methods

Fixation: 2.5% glutaraldehyde in a 0.1M sodium cacodylate buffer; Washing: sodium cacodylate buffer 3 times for 10 min each; Dehydration: in an ascending acetone series of up to 100% (7.5, 15, 30, 50, 70, 90 and 100%, for 10 min in each concentration) + critical point drying method (superdry CO₂ in a Balzers apparatus); Mounting: placed on metallic supports and coated with a thin layer of gold; Examination: JEOL SM-5200LV + SEM images transferred directly into a PC + 40 eggs for each species analyzed.

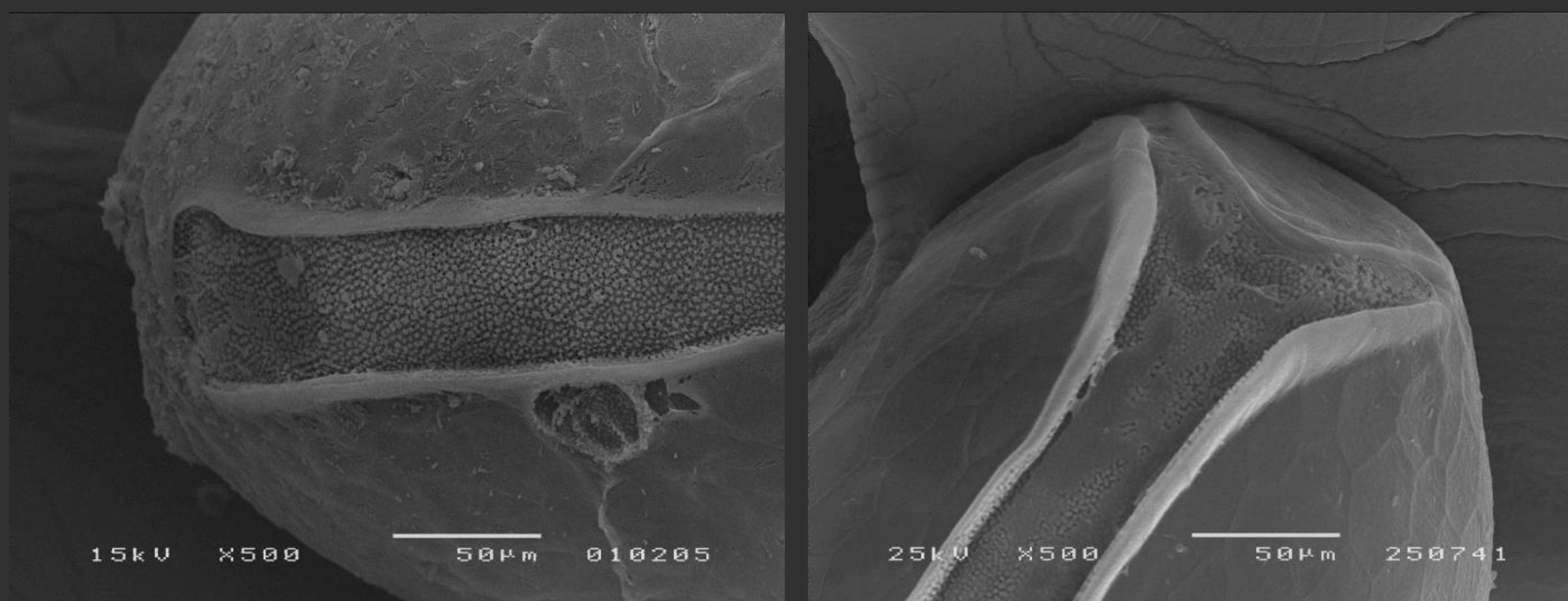
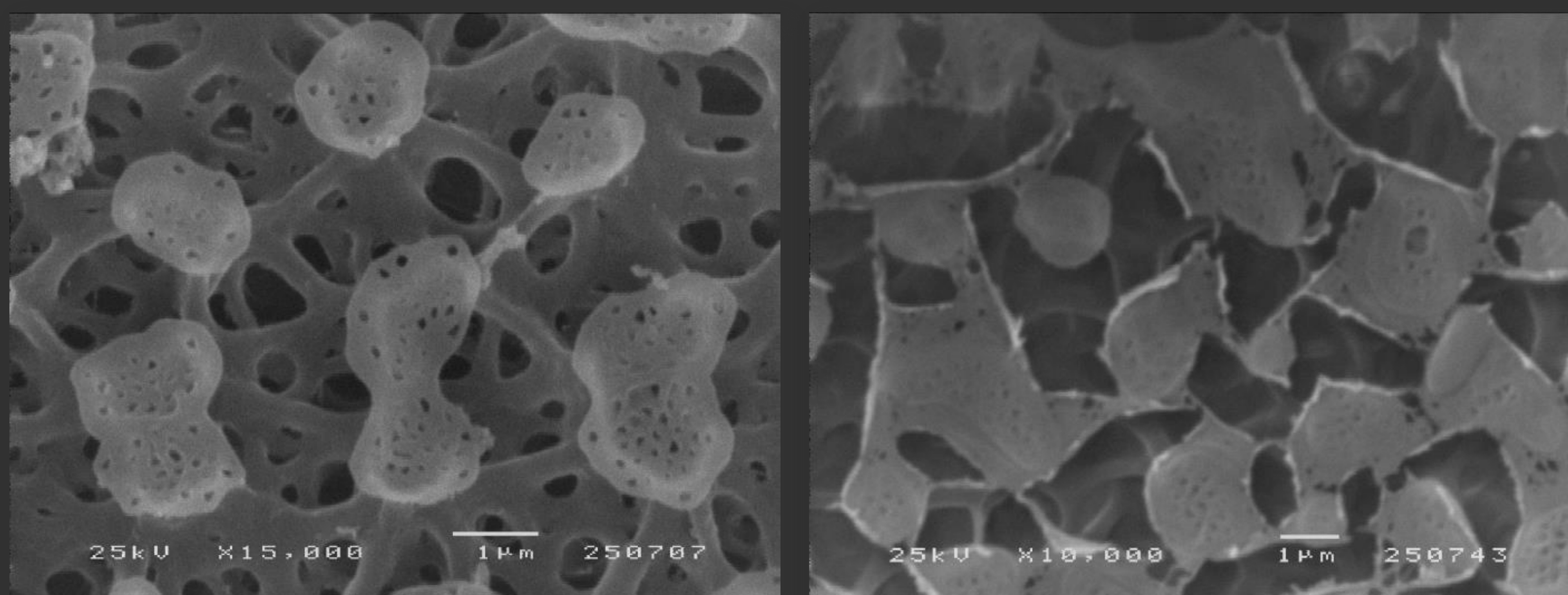


Figure 1. Scanning electron micrographs of plastron in the anterior region of the egg. SEM × 500. Scale bar = 50 μm. Left: *Calliphora vicina* plastron reaches the micropyle apparatus, finishing with a round-shape. Right: *Lucilia sericata* plastron reaches the micropyle apparatus and forks in a "y-shape".

Figure 2. Scanning electron micrographs of islands in plastron middle area. Left: *Calliphora vicina* islands with a "web" of anastomosis and several pores. SEM × 15000. Scale bar = 1 μm. Right: *Lucilia sericata* islands show few anastomosis and little pores. SEM × 10000. Scale bar = 1 μm.



Results

This study compares the ultrastructural morphology of eggs from *Lucilia sericata* (Meigen, 1826) and *Calliphora vicina* Robineau-Desvoidy, 1830, two cryptic species of blowflies frequently found in forensic context in Portugal, through SEM. It shows that it is possible to distinguish *L. sericata* from *C. vicina* through the use of qualitative criteria, as the plastron termination near the micropyle apparatus (Figure 1) and the distinctive aspect of the anastomosis in the islands located at the median area of the plastron (Figure 2), among others. Our structural results for *L. sericata* are the first ones ever recorded.

Conclusion

The morphological identification of insect eggs is very laborious and difficult, and sometimes impossible to be achieved. The use of SEM allowed to distinguishing between the eggs of *Lucilia sericata* and *Calliphora vicina*. It is therefore considered its application in further studies on morphological structures of eggs, as this technique could be used as an important tool in forensic entomology by providing useful data for additional comparisons of other cryptic sarcosaprophagous species.