



Introduction

- Blow flies are the primary colonisers of a body, and can arrive within minutes. They are acknowledged as the most important insects in determining the post-mortem interval (PMI).
- While insect evidence is used in cases of violent and unexpected deaths, it can also be helpful and used where the deceased has died from either natural causes or accidentally in their own home.
- All literature agree oldest specimen at a scene must be collected, missing the oldest specimen can be very detrimental and can lead to an under or over estimation of time since death (Amendt *et al.*, 2007,2011; Hall *et al.*,2012).
- The oldest specimens have often dispersed away to find a suitable site to pupate. This site may be some distance away from where they were feeding. Literature that is available for this stage reveals that there is very little known, and what is known is very contradictory depending on which piece of literature is read.
- Obtaining a better understanding of this understudied stage can help predict the locations where dispersing larvae and developing puparia are most likely to be found, therefore maximising collection at crime scenes.

Method

Distance Dispersal

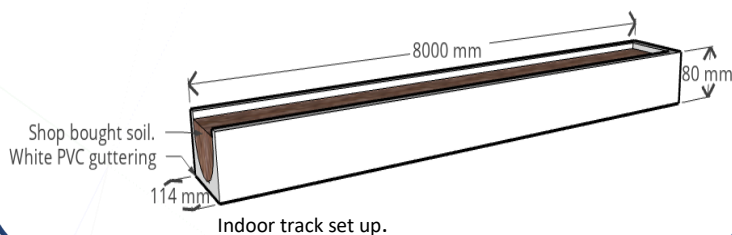
- 8 m PVC guttering, shop bought soil. 1/2 pint of post-feeding larvae from local fishing shop. Sampled in 50 cm sections.

Depth Distance

- 84l really useful box, shop bought soil. 1/2 pint of post-feeding larvae from local fishing shop. Sampled in 2 cm sections.

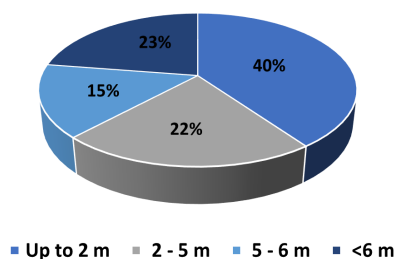
Residential Setting

- Locard House utilised (crime scene house) small, 3 story house with attached garage.



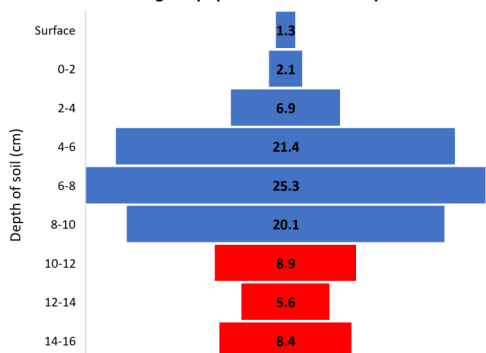
Results

Mean percentage of pupae found over the distance of the track used.



Distance experiments

Percentage of pupae found at each depth.



Depth experiments

Final pupation site.	Distance from deposition site (m)
Changing room door	3.1
To toilet door	7.0
Rear of toilet	8.55
Door into garage	7.95
Bottom of 2 nd set of stairs	5.2
Under kitchen door.	5.4

Residential setting experiments

Discussion

- Data from depth experiments agree with the standards, the majority of the pupae were found within the first 10 cm of soil.
- Distance dispersal shows that a 2 m search perimeter would not necessarily find the oldest specimen present. Over 60% of the pupae found, were found after the 2 m distance given in the standards.
- Data from residential dispersal experiments shows a varied dispersal distance. No search distance within standards for an indoor scene.
- Ceiling spaces used to migrate between areas and floor levels.
- Experimental data agrees with standards for checking under base boards. No pupae or empty pupal cases found within prep room, but large numbers of adult flies observed throughout the experiment.

References

- Amendt, J., Campobasso, C. P., Gaudry, E., Reiter, C., LeBlanc, H. N. and Hall, M. J. (2007). Best practice in forensic entomology - standards and guidelines. *International Journal of Legal Medicine*, 121(2), pp. 90 - 104.
- Amendt, J., Richards, C.S., Campobasso, C.P., Zeher, R. and Hall, M.J.R. (2011). Forensic entomology: applications and limitations. *Forensic Science, Medicine, and Pathology*, 7(4), pp. 379 - 392.
- Hall, M., Whitaker, A. and Richards, C. (2012) Forensic Entomology. In: Marquez-Grant, N. and Roberts, J. (eds.) Forensic Ecology Handbook. From Crime Scene to Court. Chichester: John Wiley and Sons Ltd, pp. 111-131.