

# Pollen in Domestic Dwellings: Forensic Implications

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# Outline

Role of experimental studies

Three examples

- Spatial and temporal dimensions of a room
- Spatial and temporal dimensions on paper
- Persistence under fire/extreme heat conditions

Implications for forensic geoscience

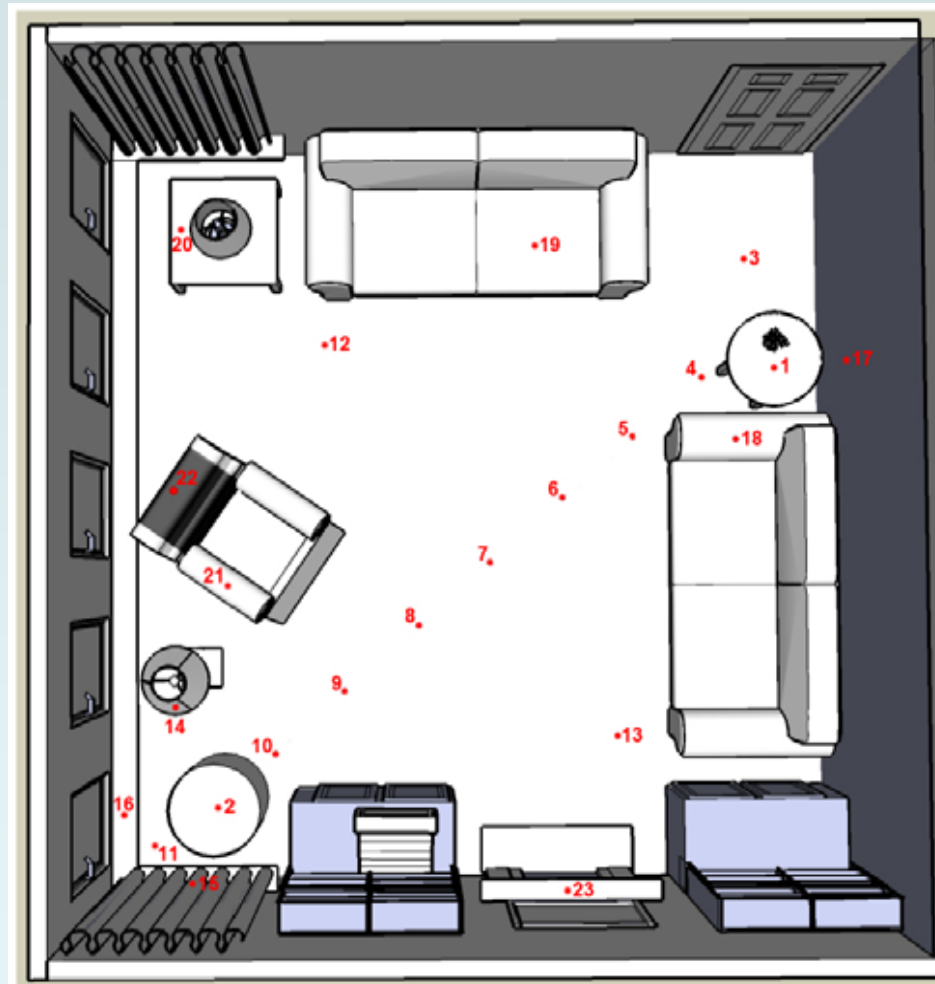
## Role of experimental studies

Mimic forensic reality

Establish primary and secondary levels  
of theory

Can be key for interpretation of analysis

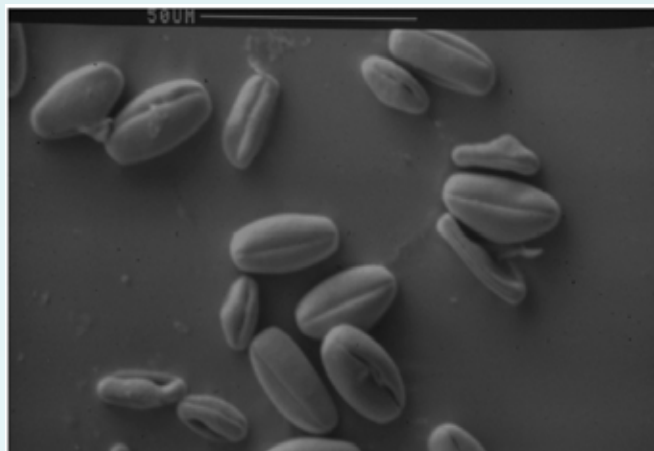
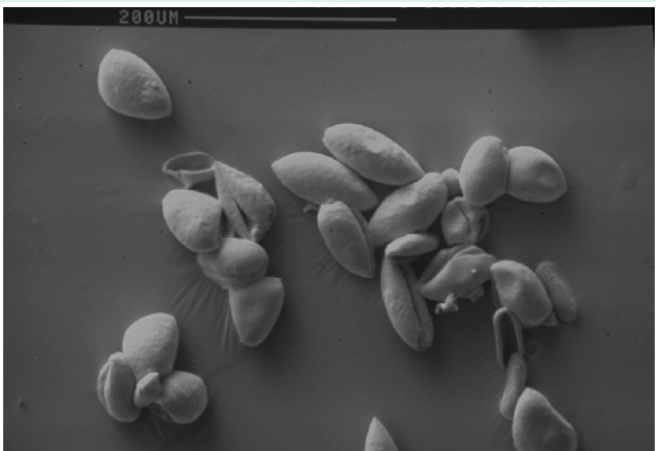
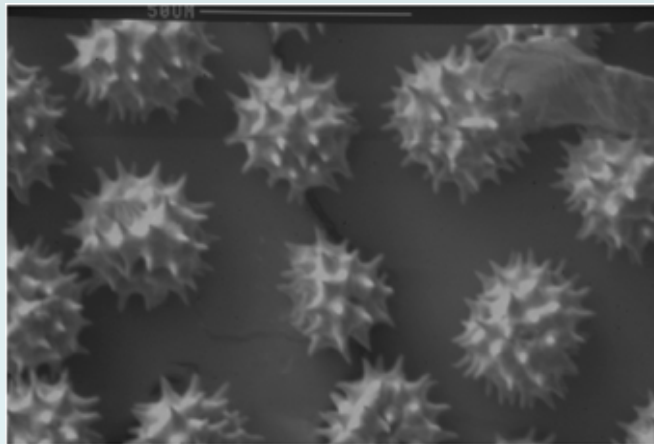
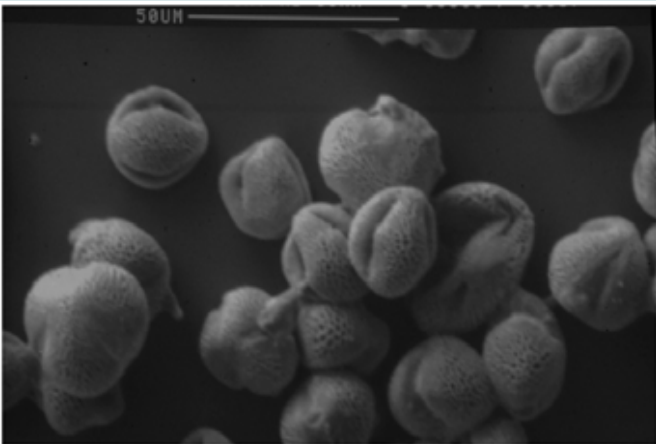
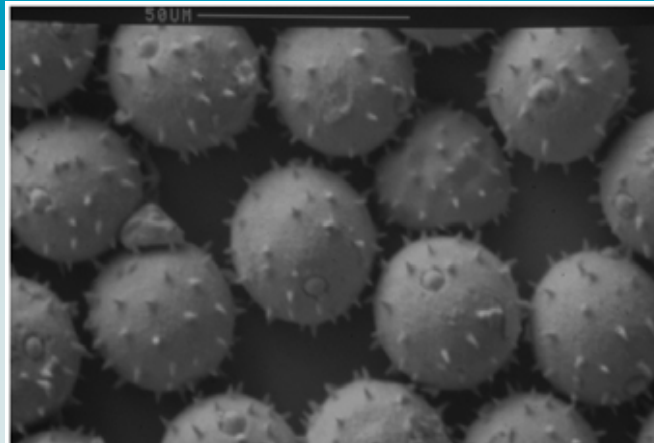
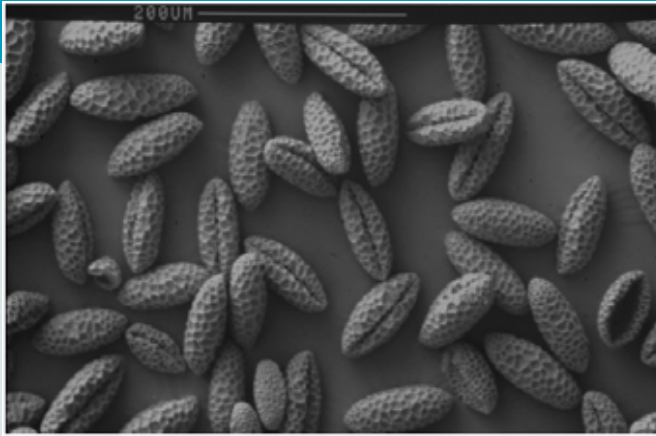
# Experiment 1: Pollen within a room



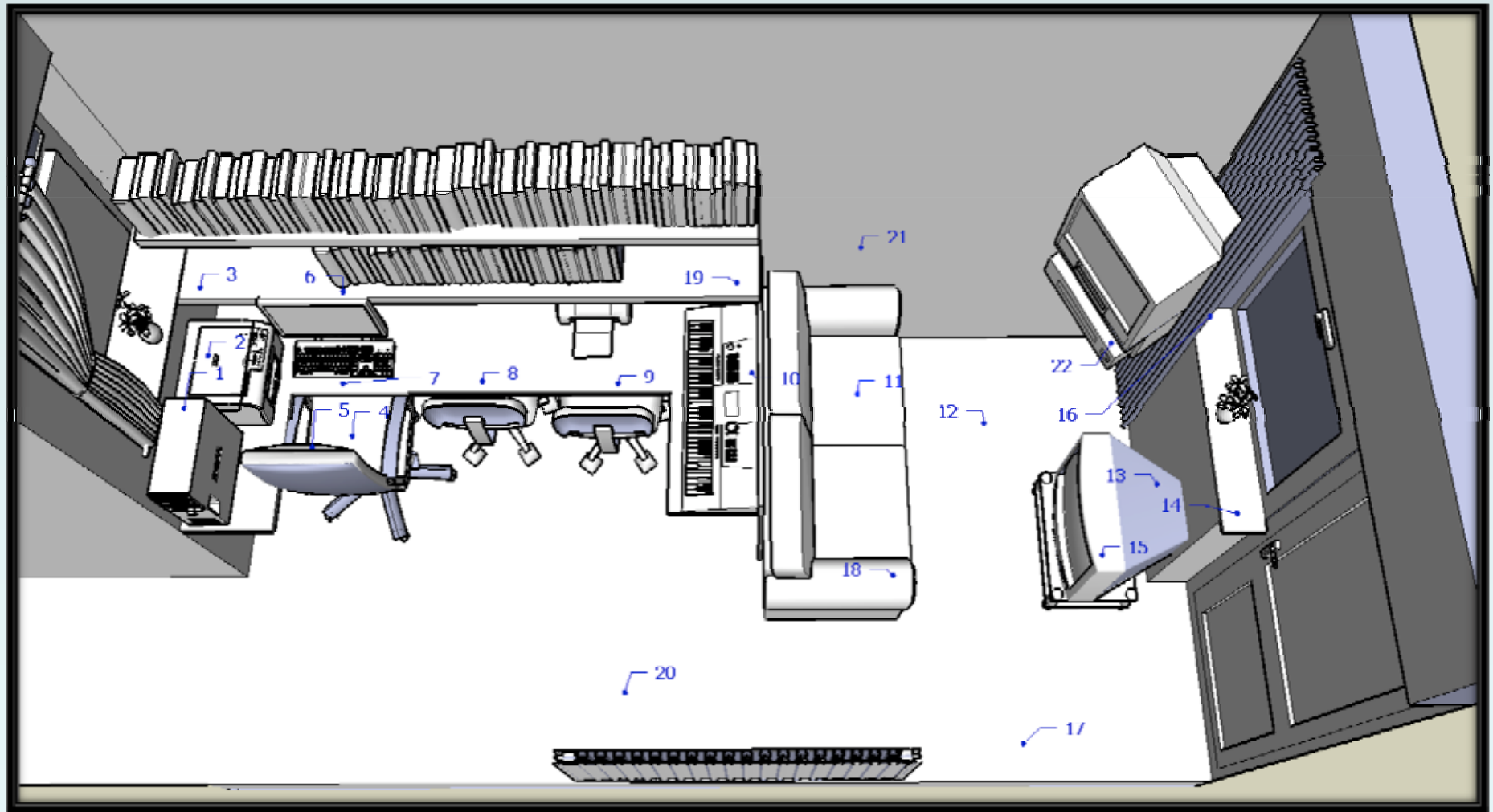
Morgan, R. M., Allen, E., Lightowler, Z. L., Freudiger-Bonzon, J. and Bull, P. A. 2008 A forensic geoscience framework and practice. *Policing: A Journal of Policy and Practice* 2: 185-195



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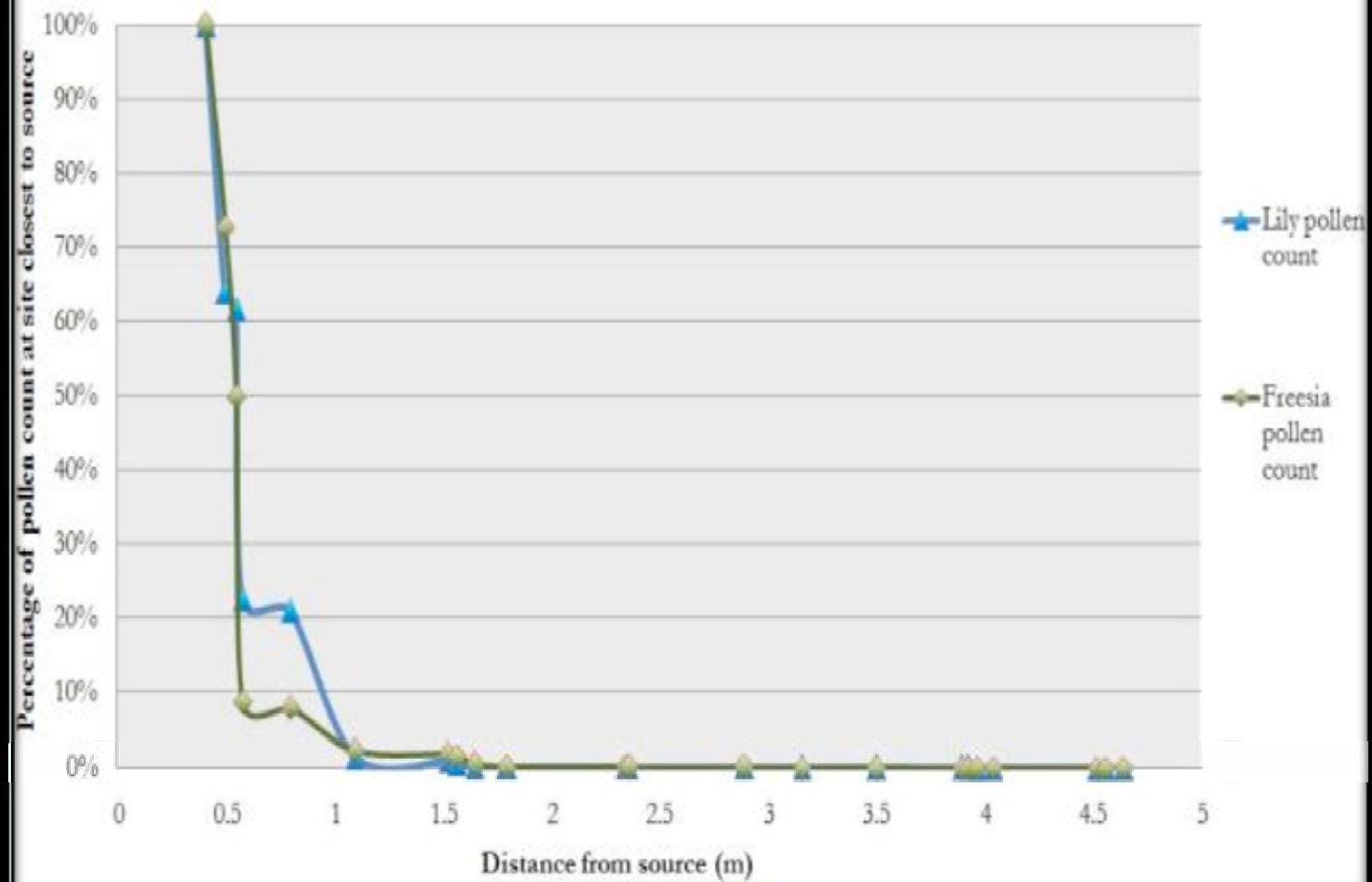
# Pollen in a room – scenario 2





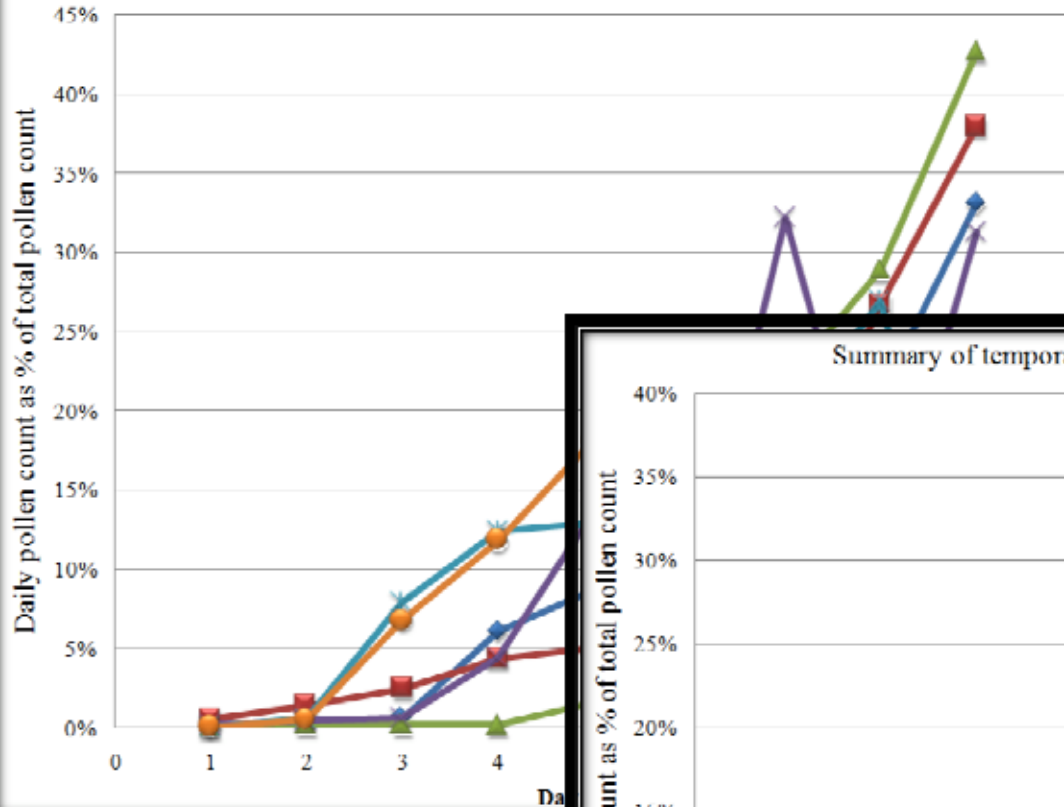


Graph to show decay in pollen count across space, as a percentage of pollen count from site closest to the pollen source



0.0 0.0 0.0 0.0 0.0 1.1 1.1 1.1 1.1 2.4 2.4 2.4 2.4 3.2 3.2 3.2 3.2 4.0 4.0 4.0 4.0  
Distance from source (m)

Summary of temporality of Lily pollen count: Runs 1 to 6



Summary of temporality of Freesia pollen count: Runs 1 to 6

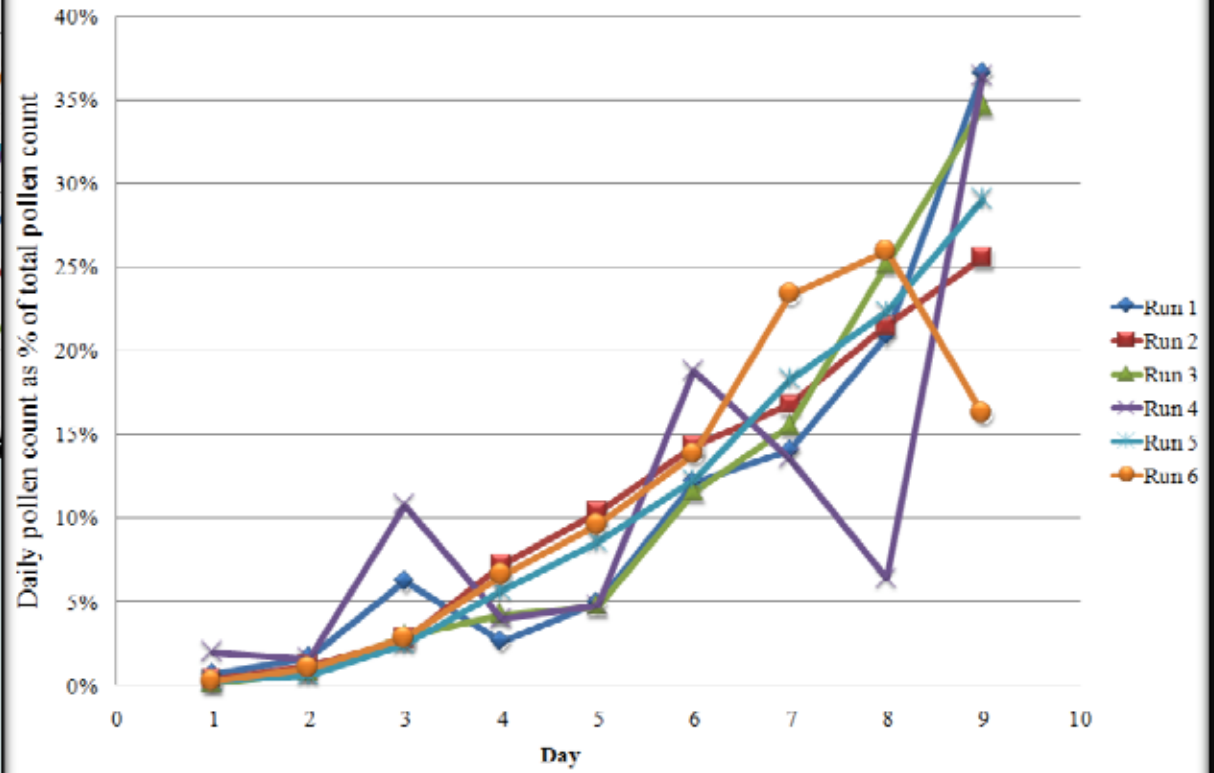


Figure 4.4.7.a. Graph to show persistence of pollen after removal of pollen source

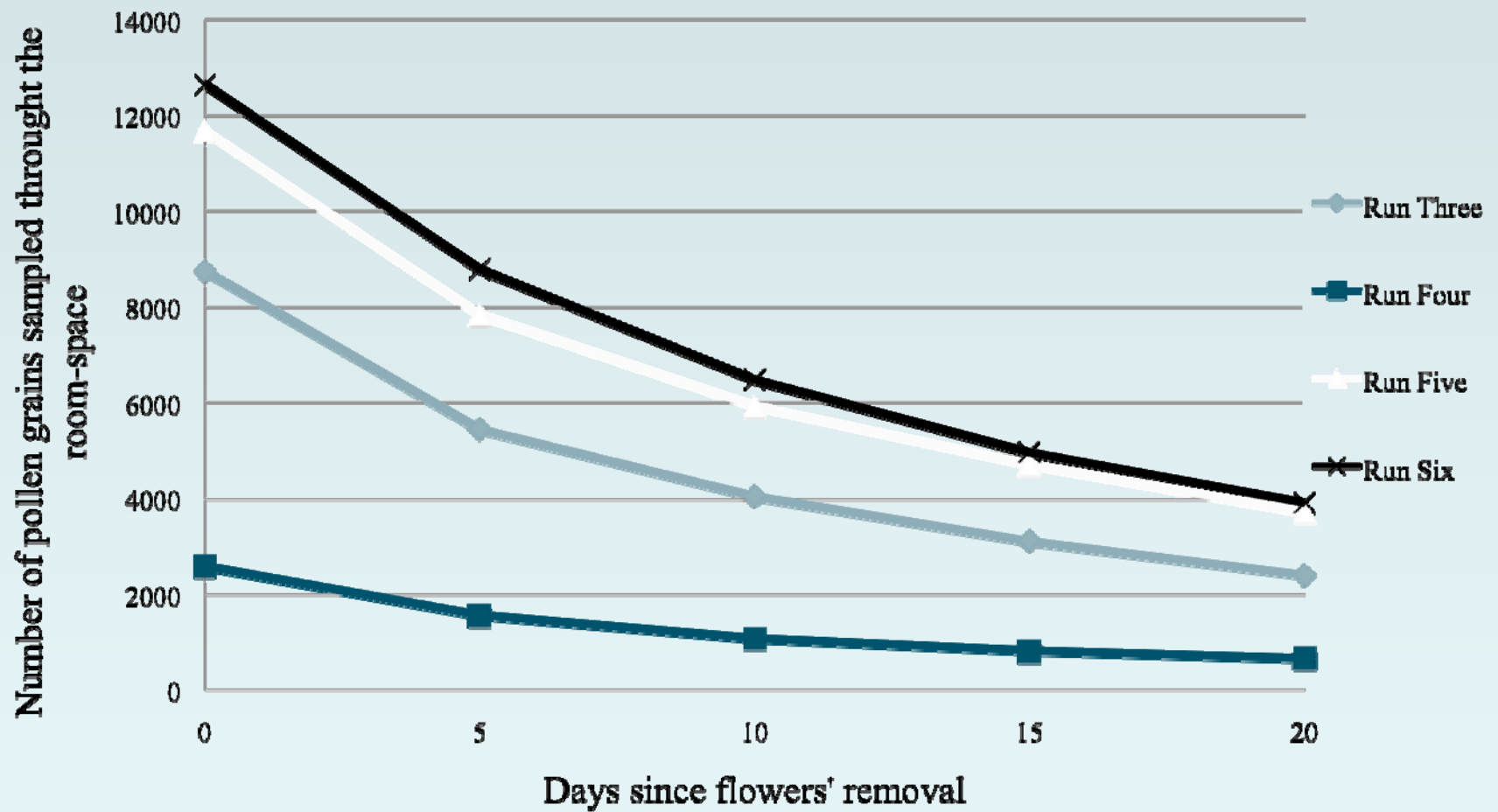
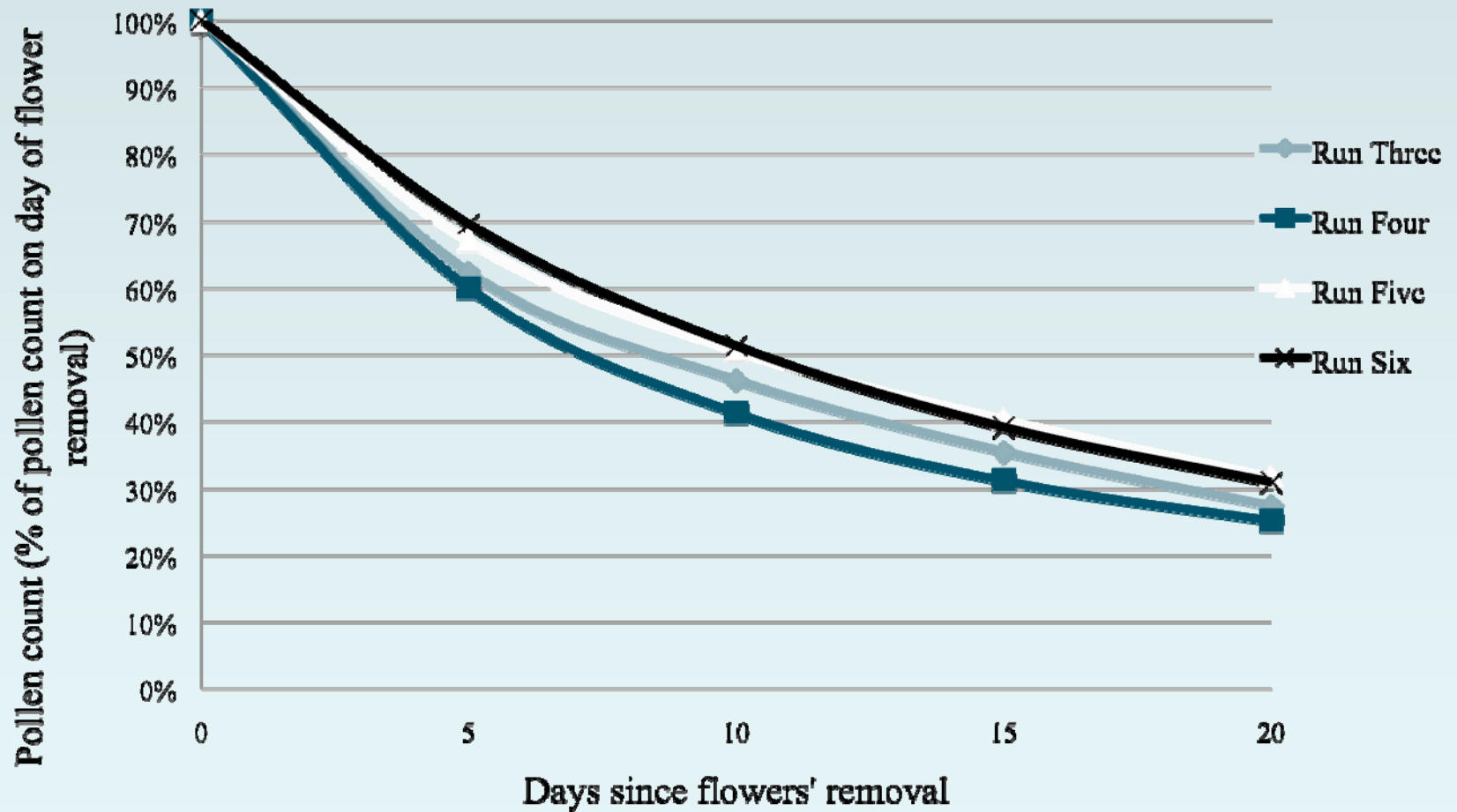
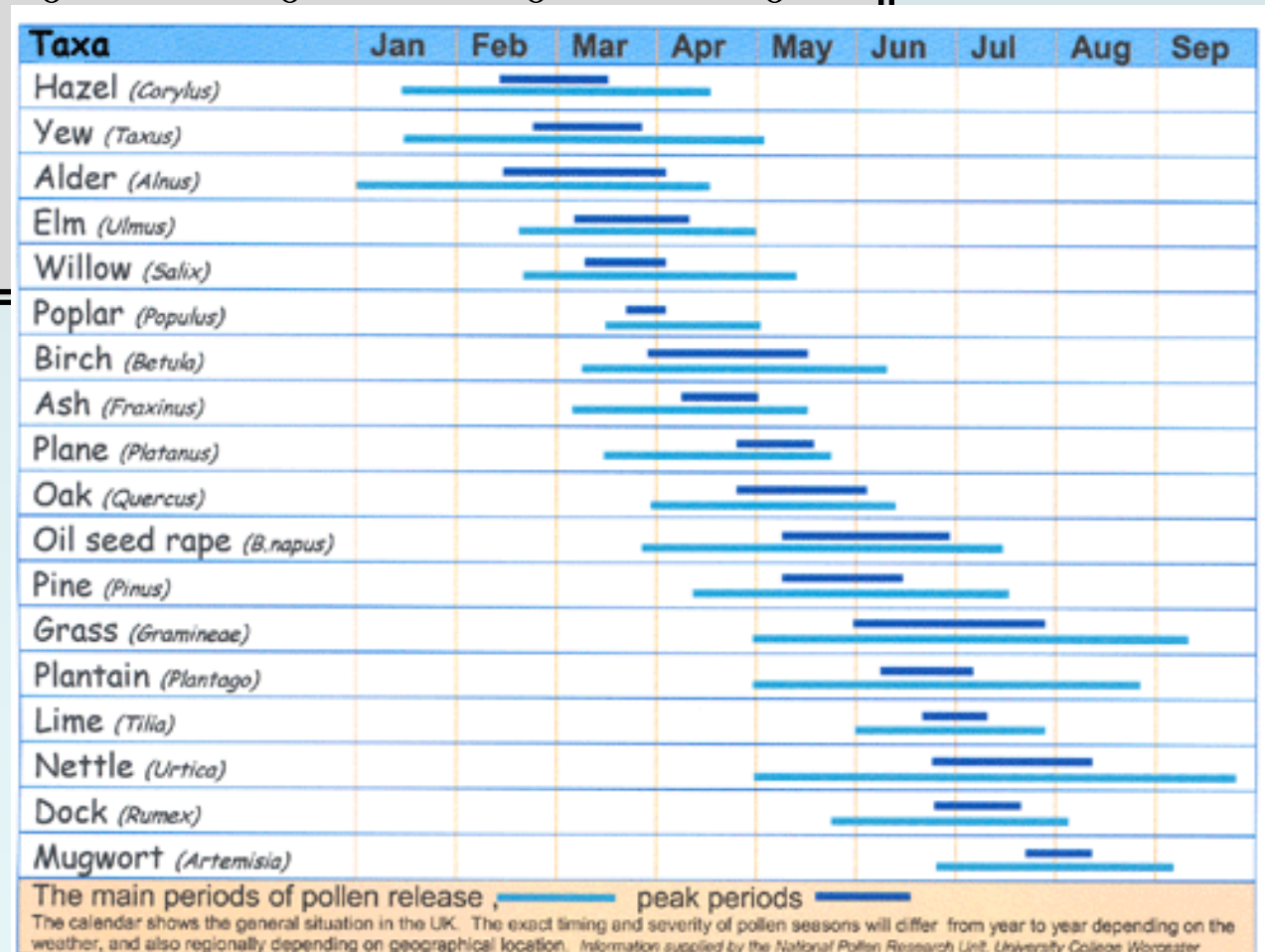


Figure 4.4.7.b. Decay in pollen count after flowers removed from room



	Grass	Tulip ( <i>Tulippa</i> )	Fuchsia ( <i>Thalia</i> )	Oak ( <i>Quercus</i> )	Pine ( <i>Pinus</i> )
Run one	0	0	0	0	0
Run two	0	0	0	0	0
Run three	196				
Run four	504				
Run five	739				



# Findings

Spatial patterns -Distance decay

Temporal patterns

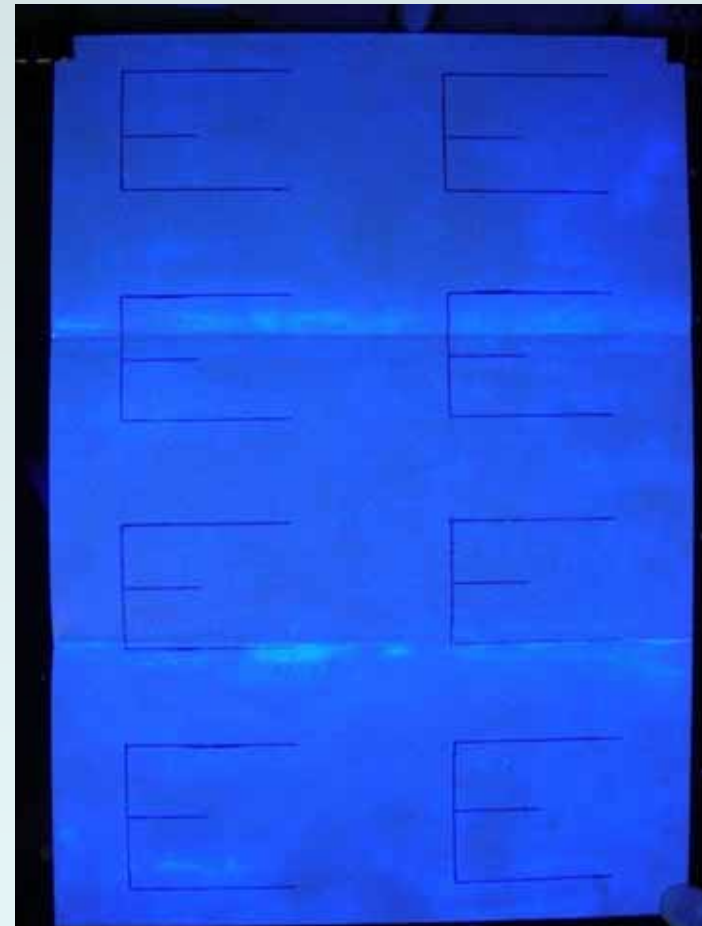
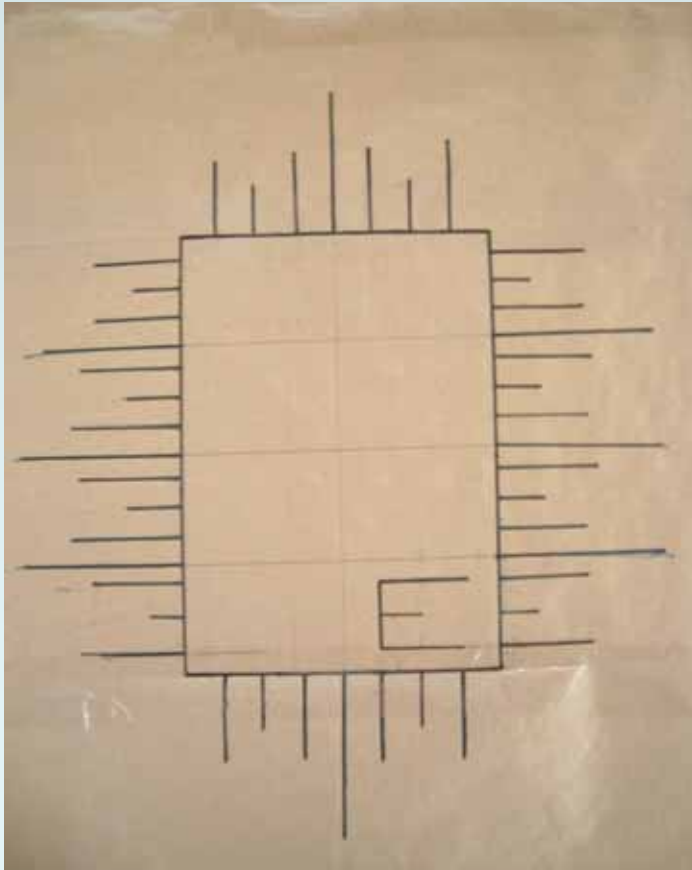
Repeatability

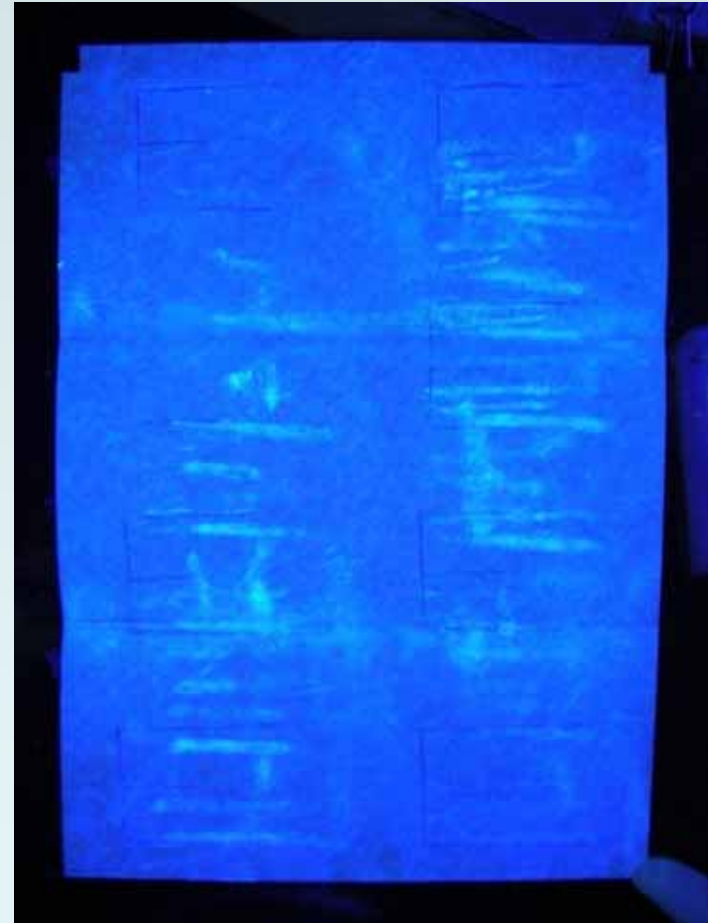
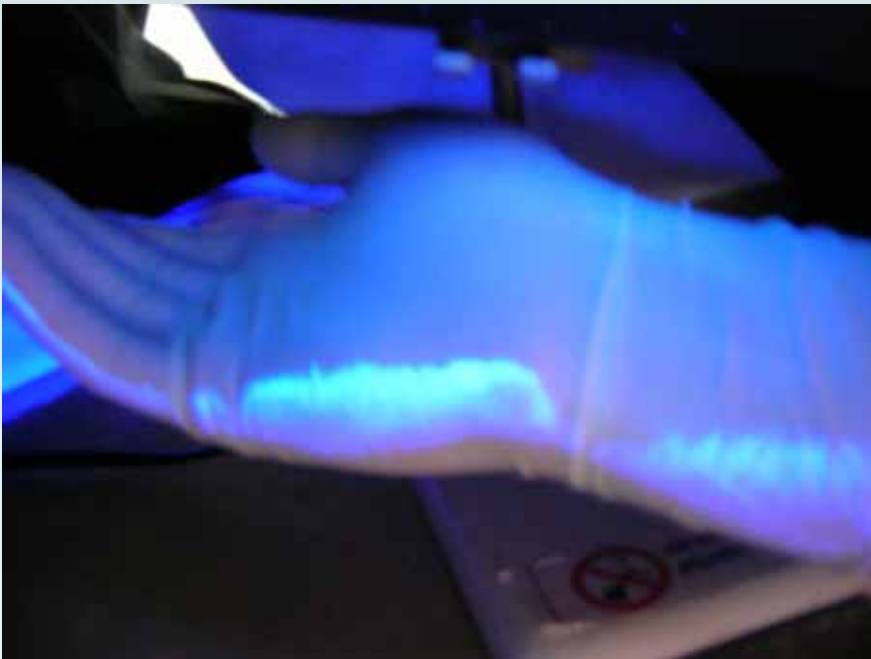
Disturbed/undisturbed sites

Soft v hard furnishings

Outside influences

# Experiment 2: Pollen on ink and paper









# Findings

Powder a reasonable proxy for pollen

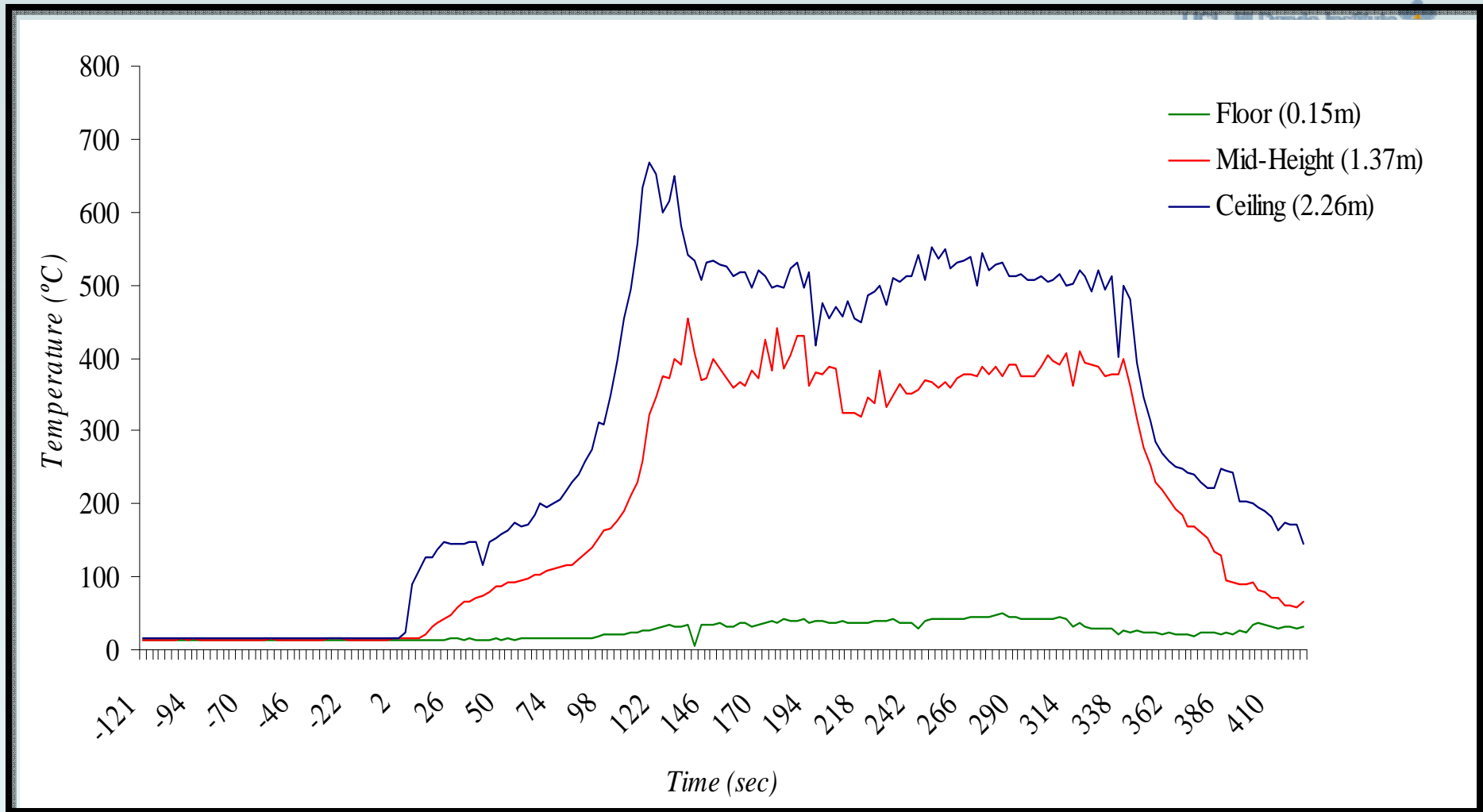
Pollen persists on documents

Different types of pollen exhibit similar behaviour

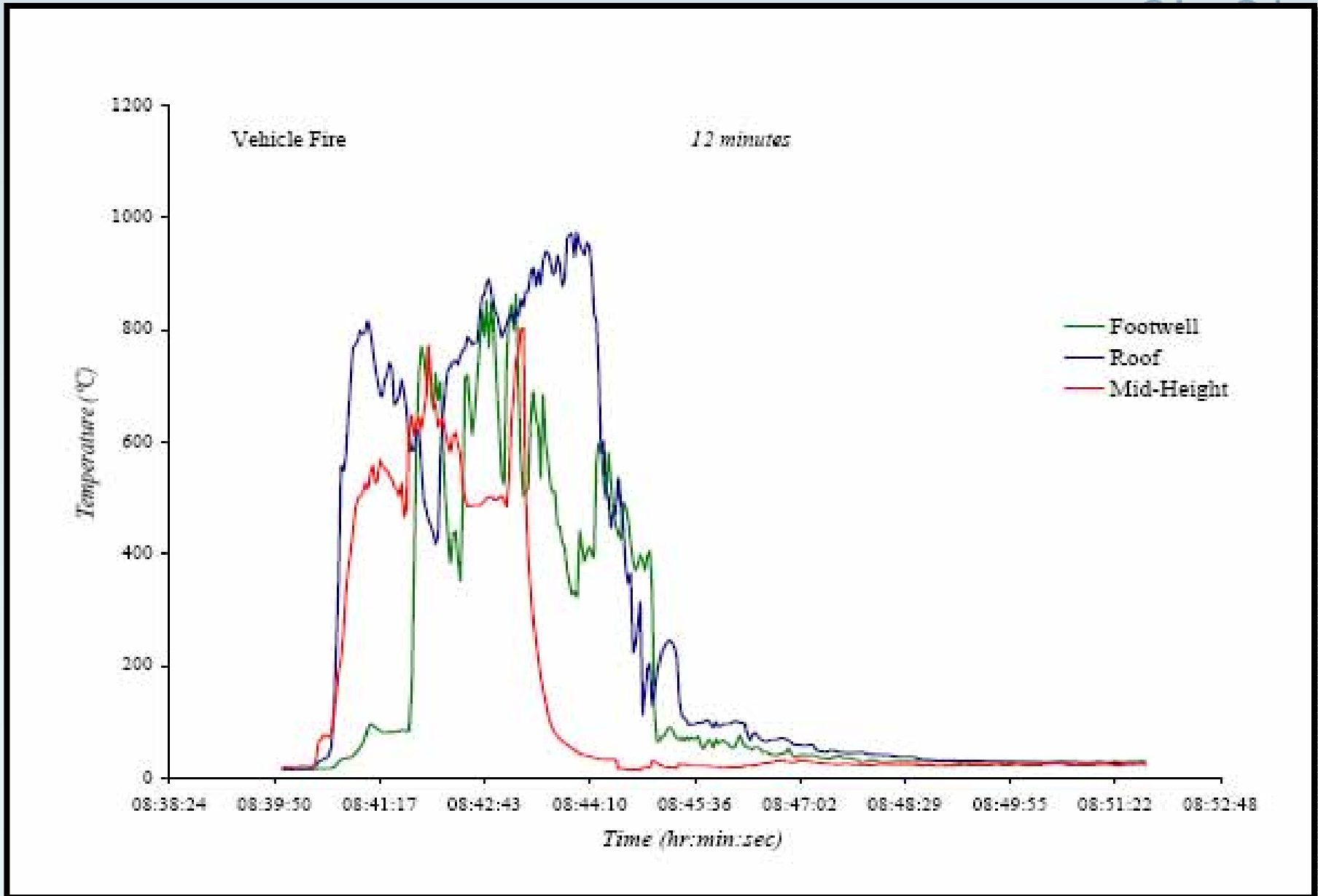
Potentially rich sources of pollen: Envelope and pen nib

# Experiment 3: Pollen preservation in heat and fire

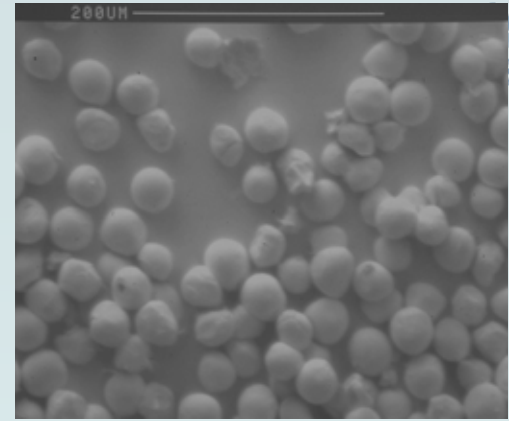
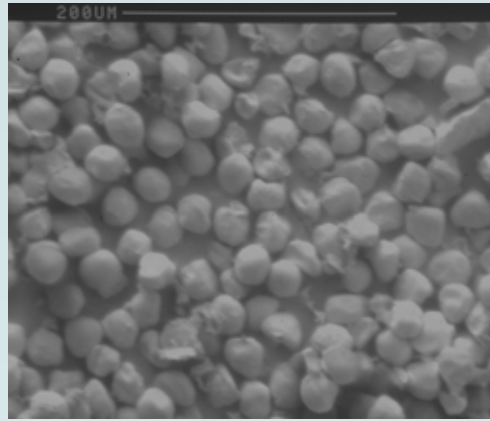
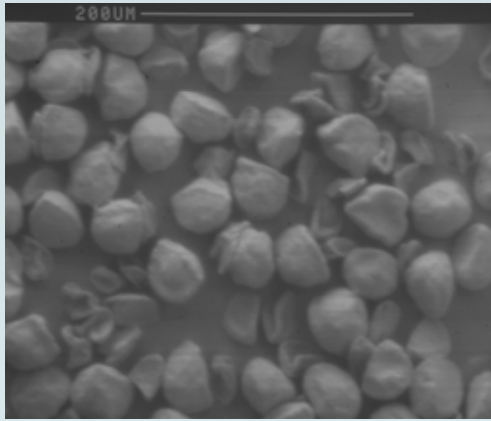




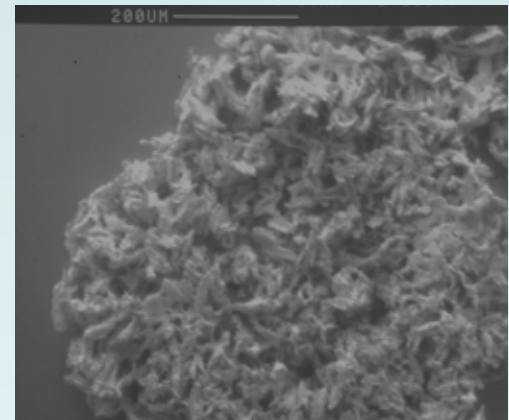
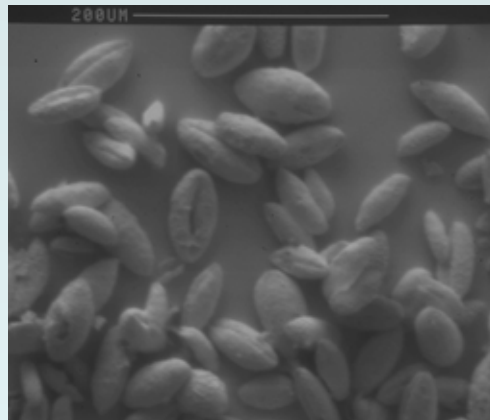
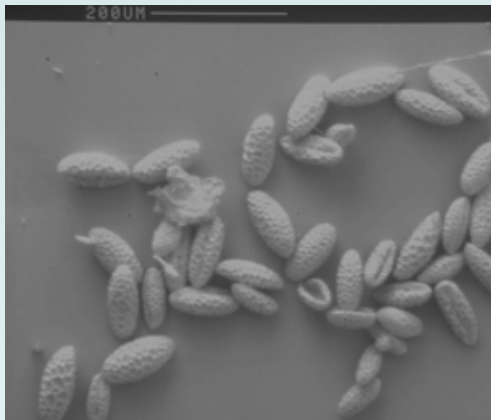
Putori Jr, A.D. and McElroy, J. (2000) 'Full-Scale House Fire Experiment for InterFIRE VR', Report of Test, *Published by U.S. Department of Commerce, National Institute of Standards and Technology.*



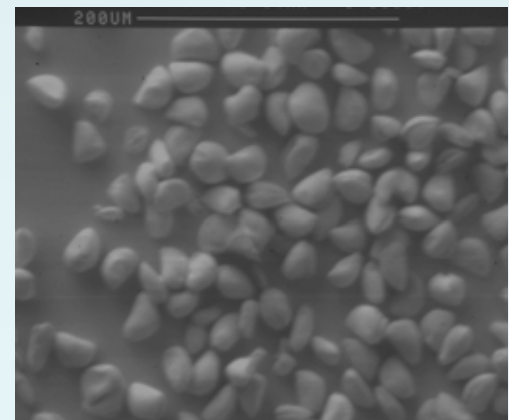
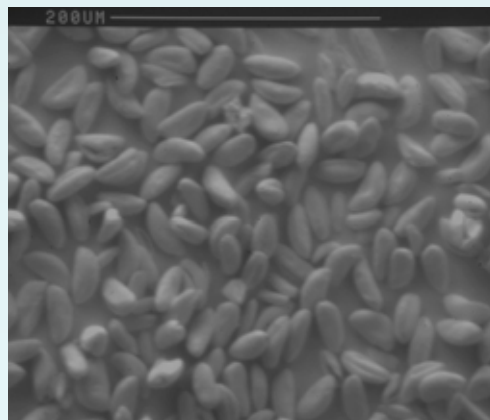
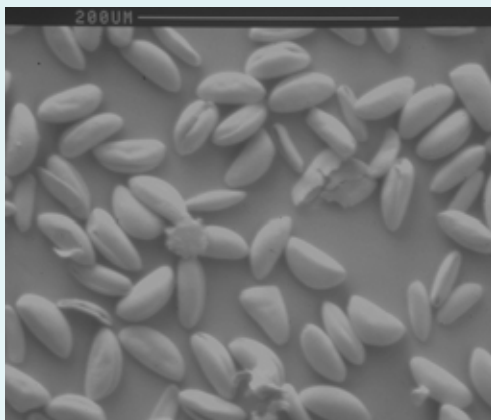
*Tulipa*



*Lilium*



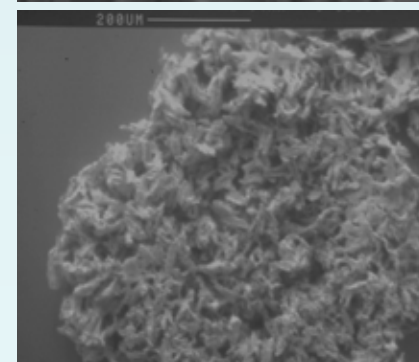
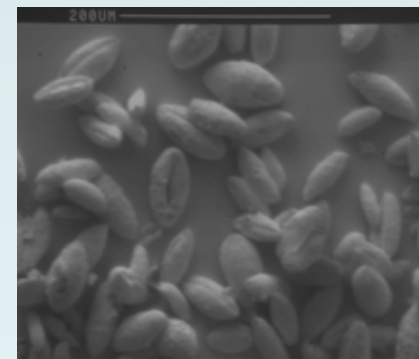
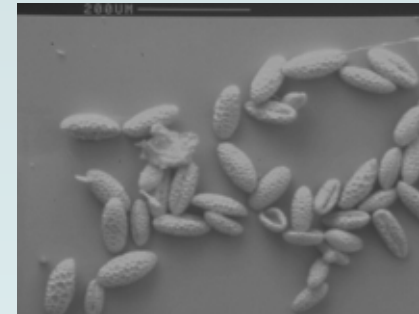
*Narcissus*

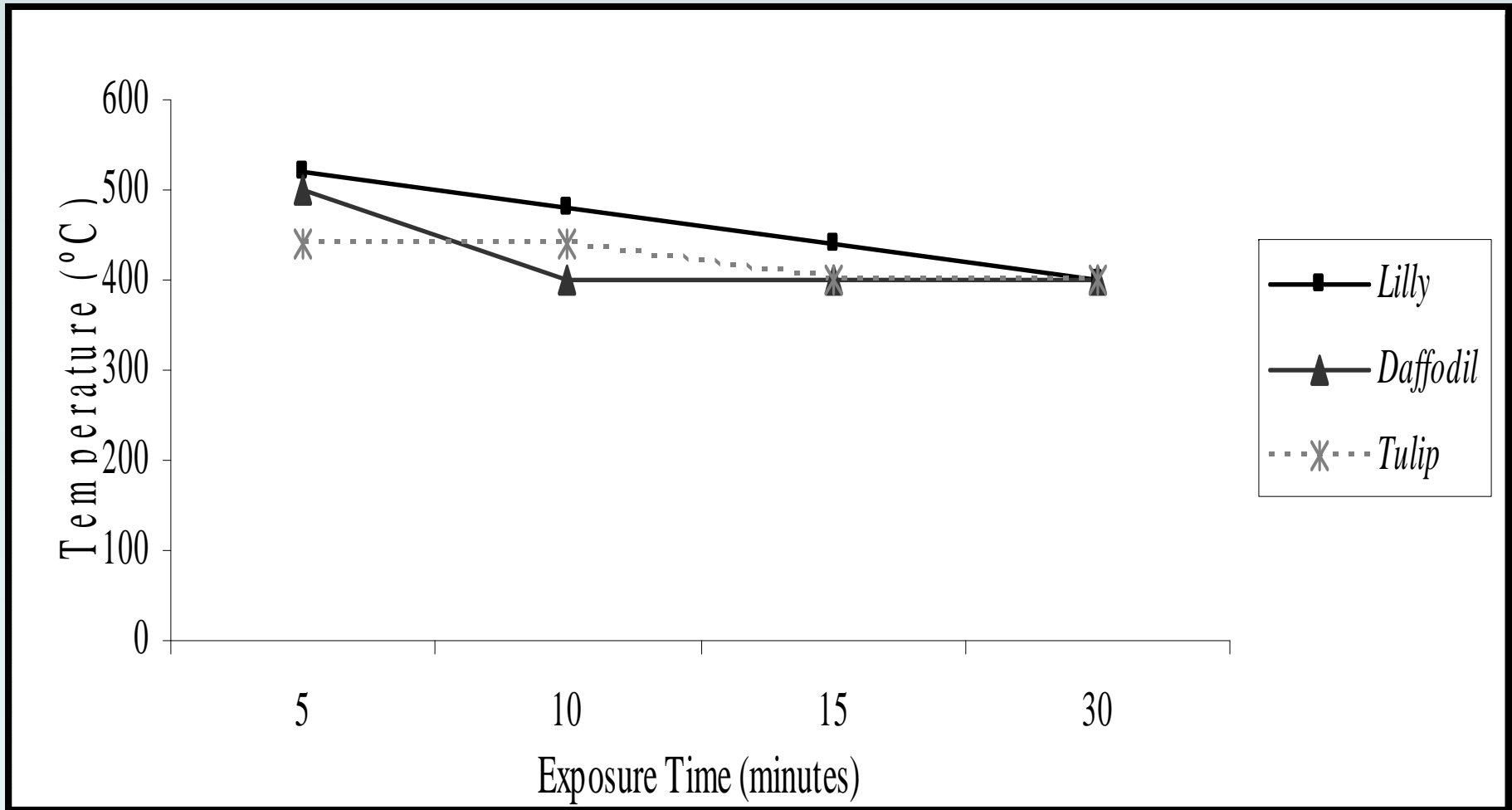


*Classification*  
1

*Classification*  
2

*Classification*  
3







# Findings

Variability in pollen persistence when exposed to high temperatures.

Temperature threshold for pollen identification is higher than expected.

Pollen can withstand these higher temperatures for longer than thought.

Variability in the temperatures reached in domestic dwelling fires indicates recovery of viable pollen possible.

# Implications

Pollen very important in anthropogenic settings

Spatial and temporal trends

Distinctive combinations have potential to aid investigations