



**Improving Animal Models of
Human Behavior and Social Processes**

**Evolution of Sociality in Wasps:
Implications for Comparative Studies
of Social and Behavioral Processes**

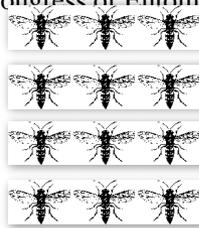
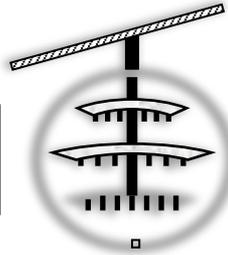
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NIH OppNet

*July 23-24, 2012
Rockville, Maryland*

Evolution of Sociality in Wasps

Evans, 1958. The evolution of social life in wasps. Proceedings of the 10th International Congress of Entomology 2, 449-457.



Worker caste morphologically distinct

Worker caste defined

Egg laying by single female

Derived traits

Stage III: Queen Concept

Female feed offspring other than their own

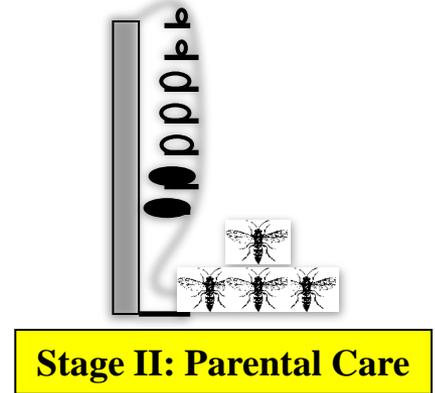
Life of females prolonged to overlap offspring

Incipient sociality

Food macerated and fed directly to larvae

Egg laid in empty cell

Progressive provisioning



Stage II: Parental Care

Nest made first, several prey added

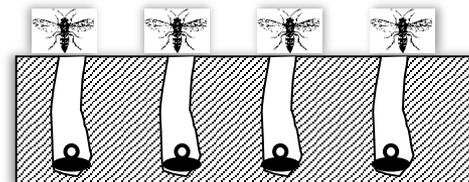
More prey added after egg laid

Prey placed in nest

Prey stung, dragged to hole

Prey paralyzed

Ancestral traits



State I: Nest as Locus

Behavioral and Sociological Traits

Nest as Locus

- ➡ 1. Home base/infrastructure
- ➡ 2. Defense
- ➡ 3. Protection of young

Parental Care

- ➡ 4. Provisioning
- ➡ 5. Age-specific division of labor
- ➡ 6. Clan/kinship

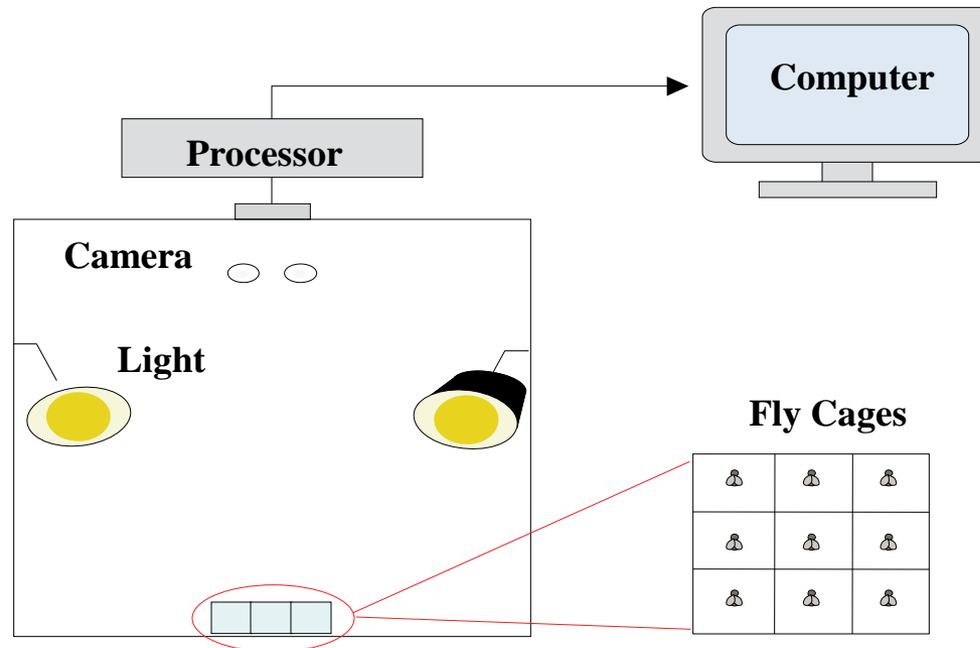
Queen

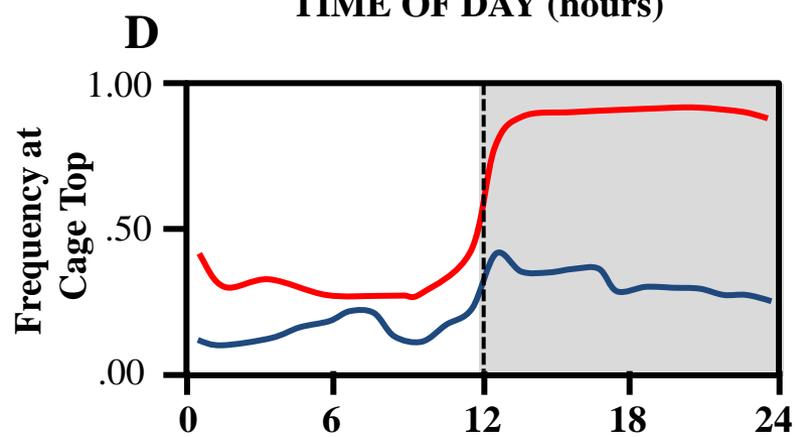
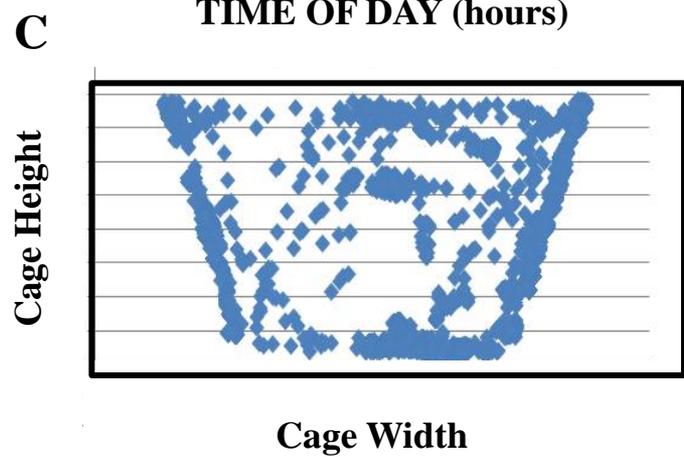
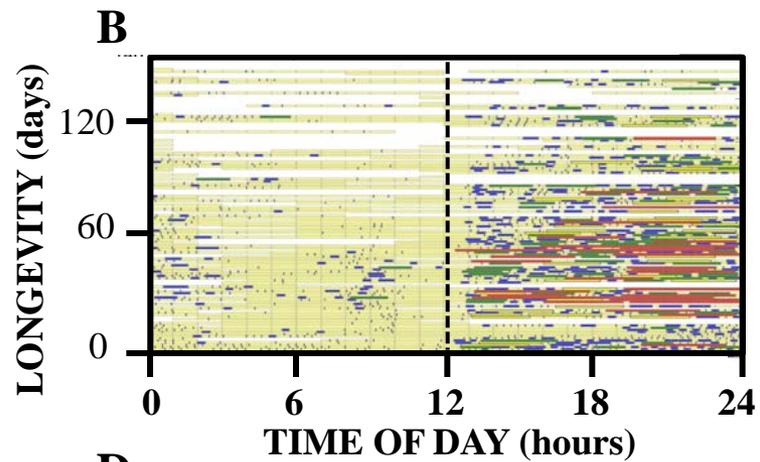
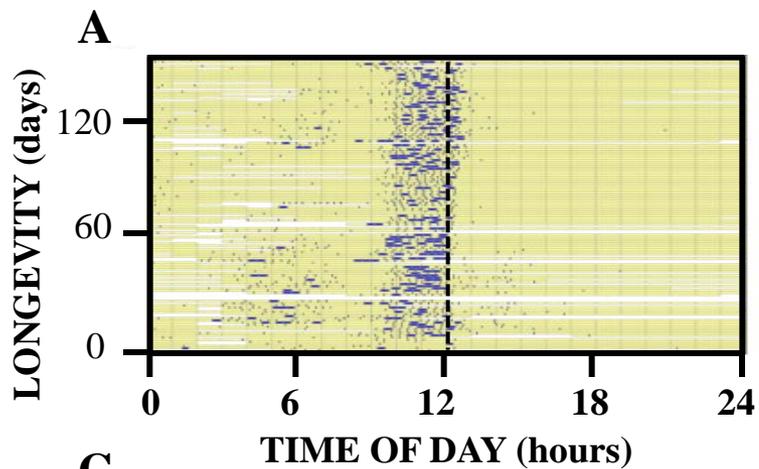
- ➡ 7. Caste system
- ➡ 8. Advanced sociality
- ➡ 9. Sophisticated communication

Recording Lifetime Behavior and Movement in an Invertebrate Model

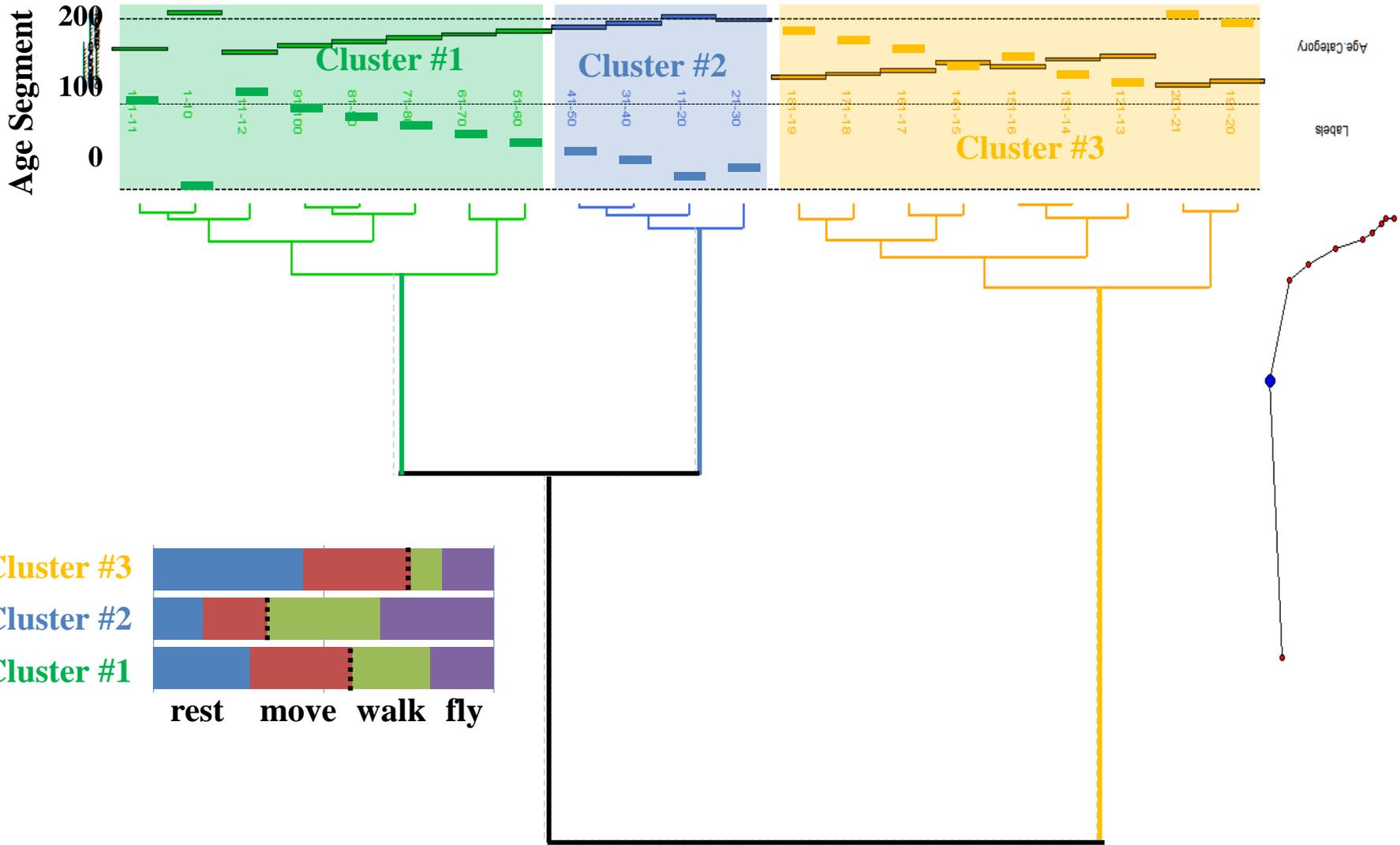
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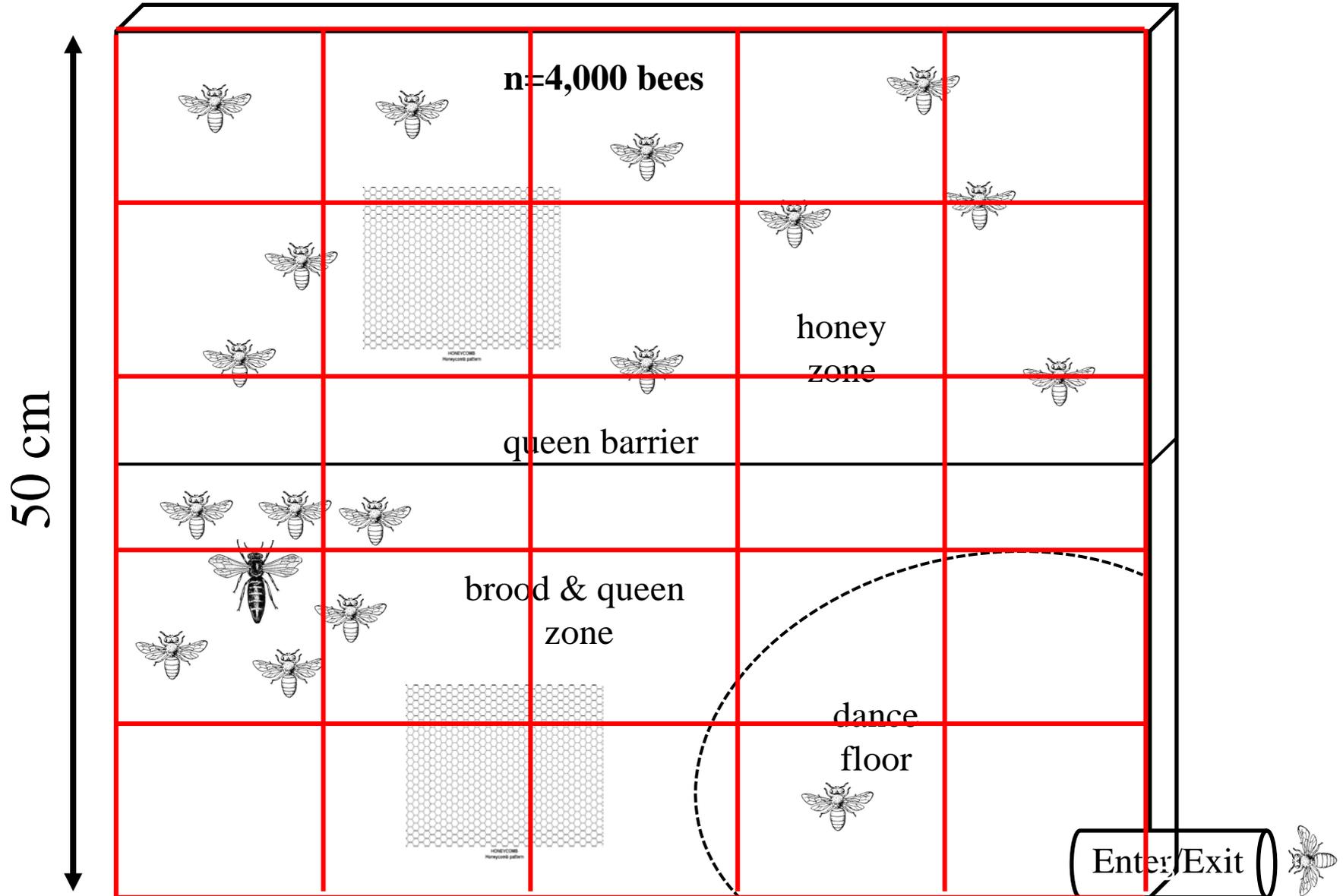




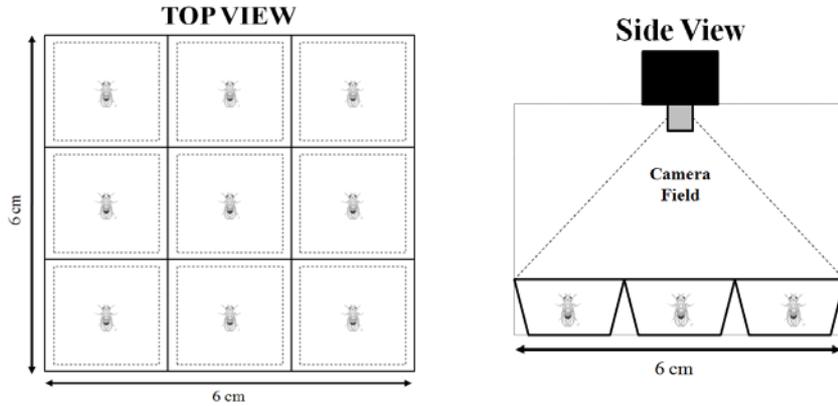
Dendrogram of Age-specific Behavior Similarities Across the Life Course of Mexflies (by 10-day age segments)



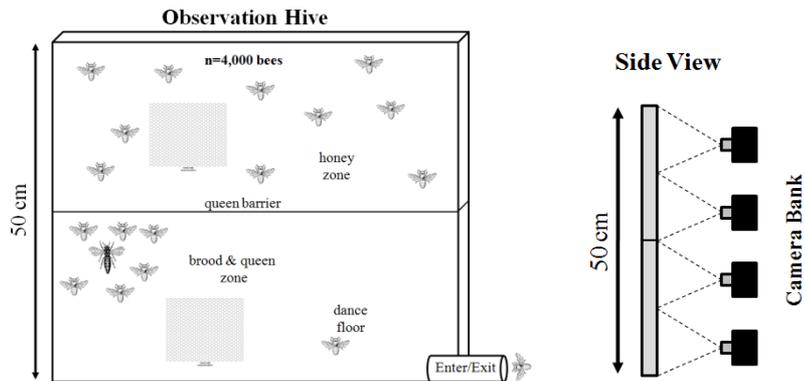
Observation Hive



Electronic Monitoring Systems



Drosophila:
High definition, informatics-level data, continuous



Honeybee:
High definition, informatics-level data, continuous



Thank You