

# Honey bee biology

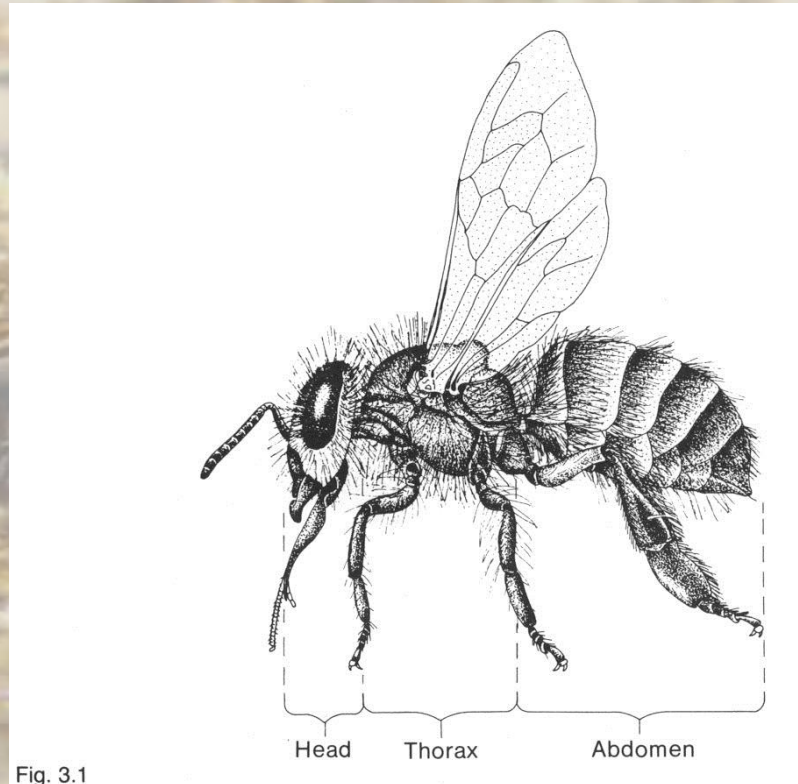
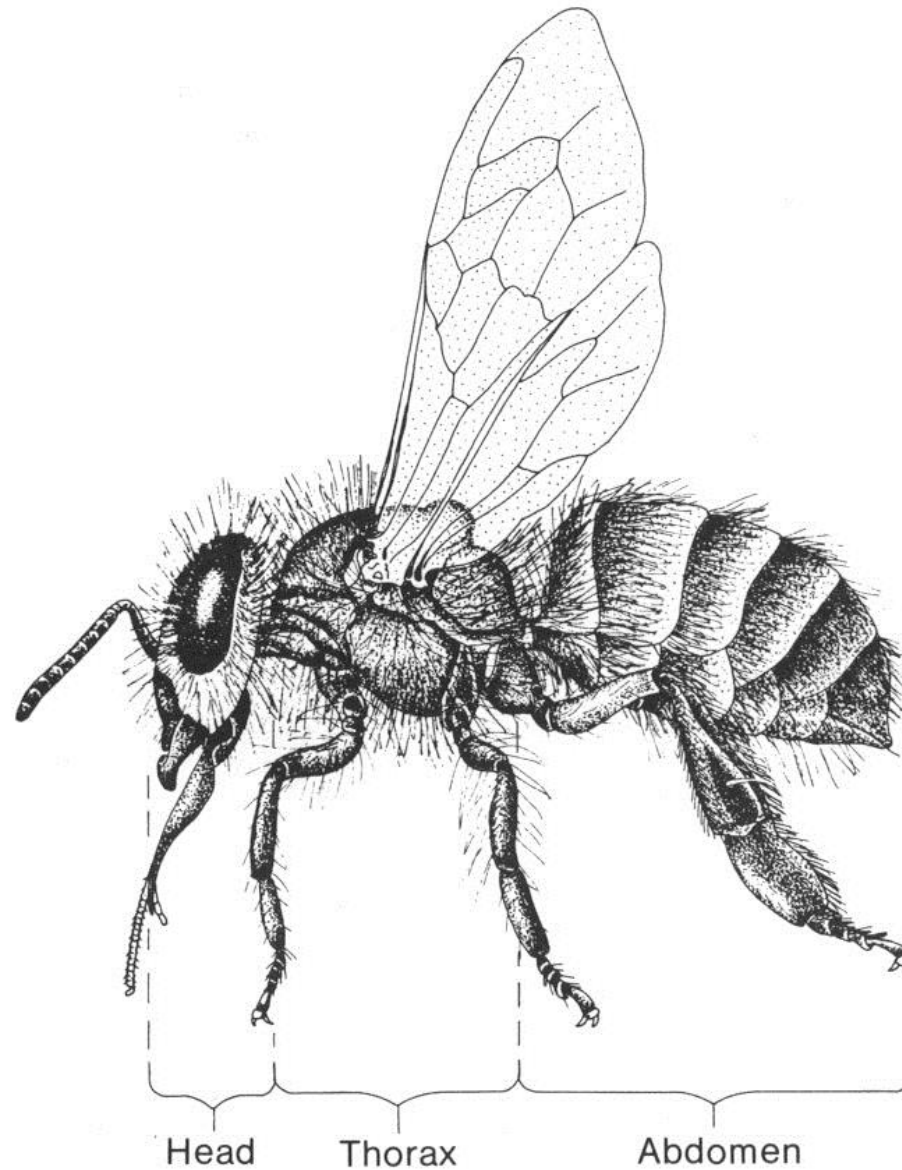


Fig. 3.1

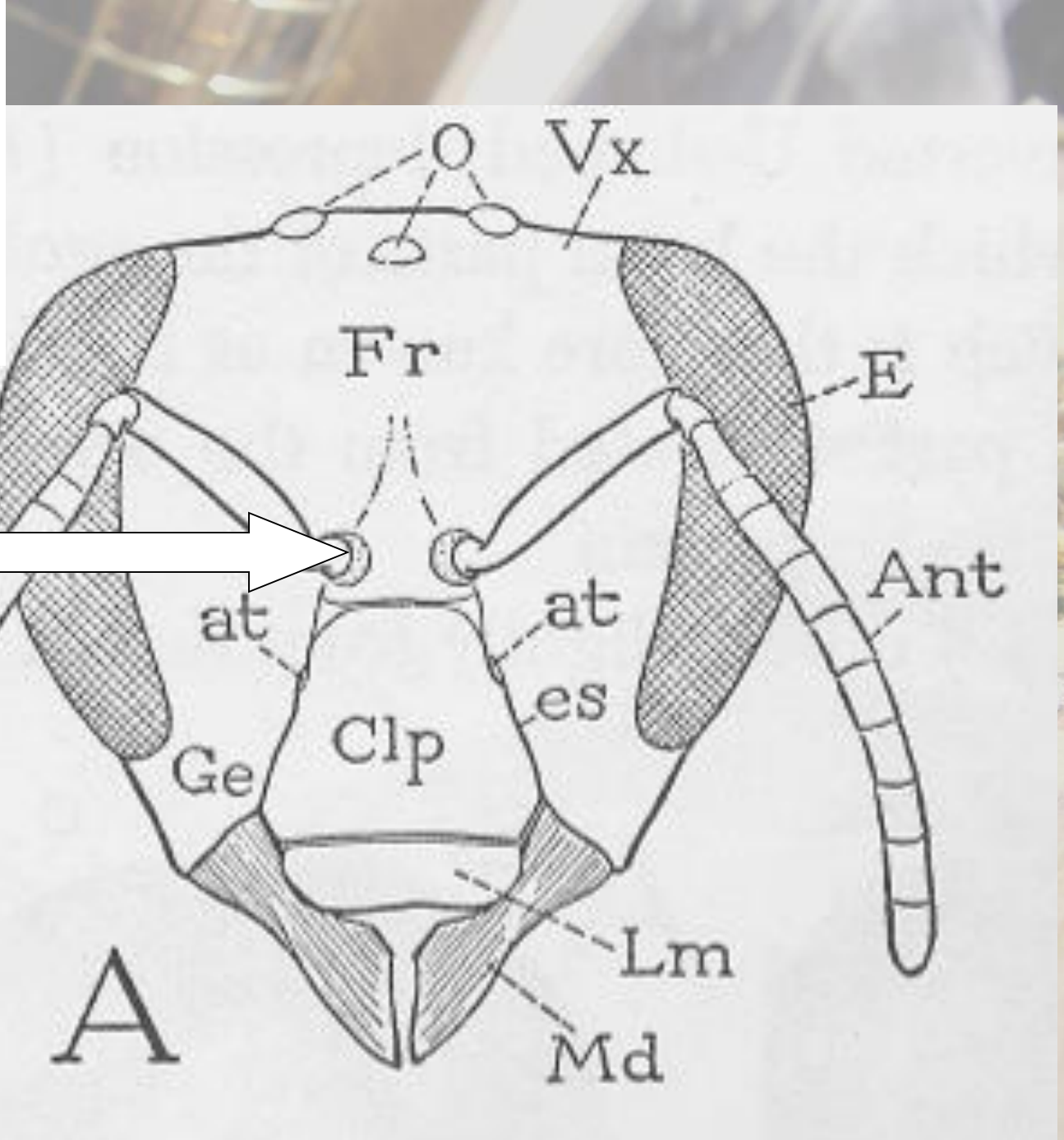
**Jamie Ellis, PhD – [jdellis@ufl.edu](mailto:jdellis@ufl.edu)**  
**Honey Bee Research and Extension Laboratory**  
**University of Florida**

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Epidermis + cuticle = integument

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Johnston  
Organ

The fore and hind wings are held together with little hooks called hamuli

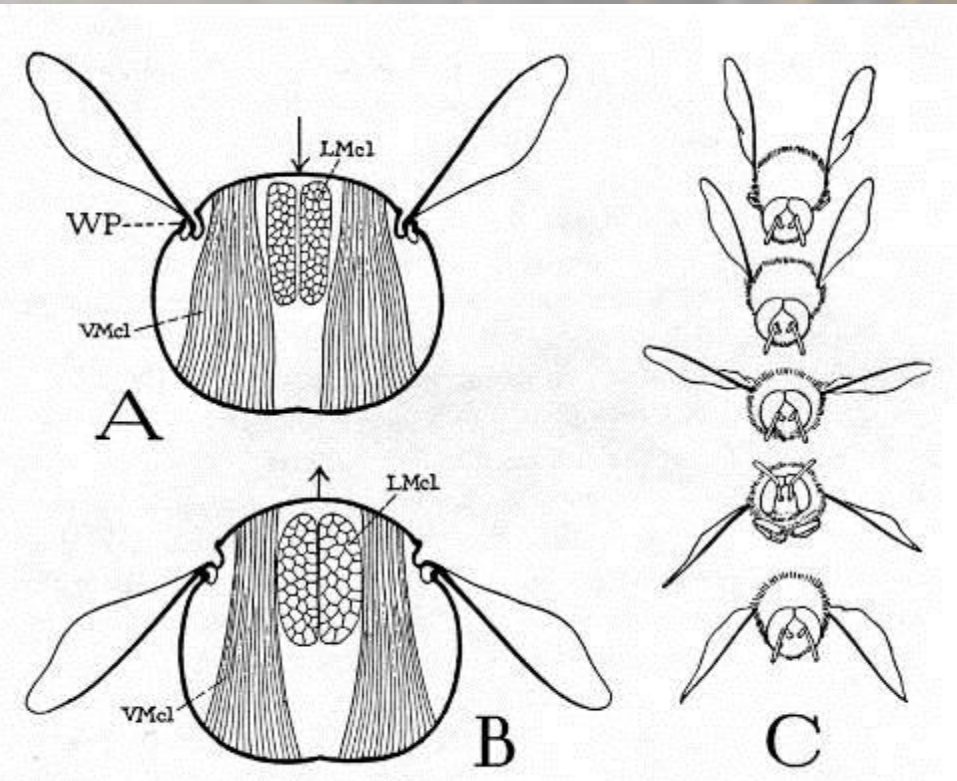
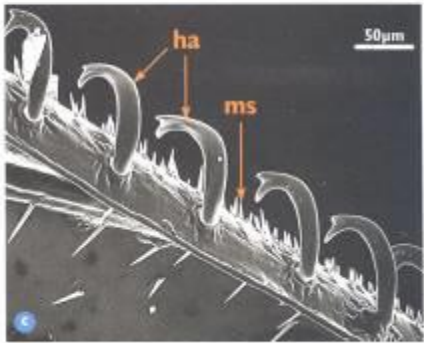
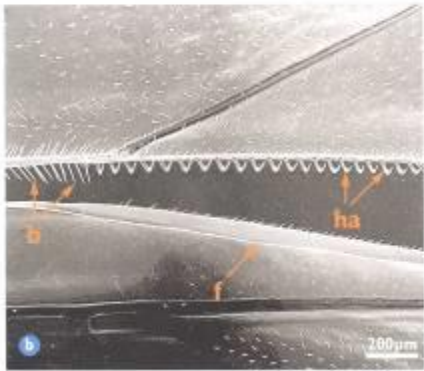
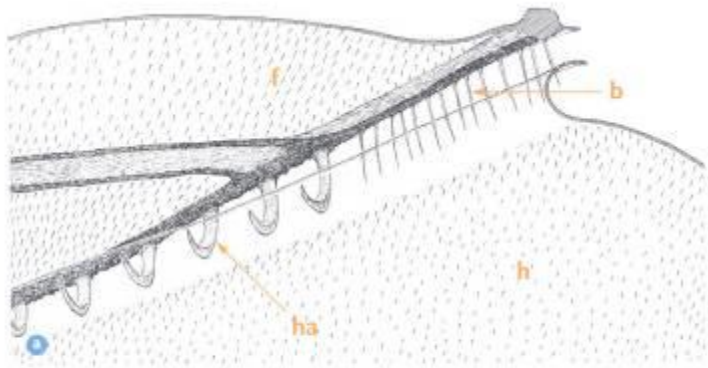


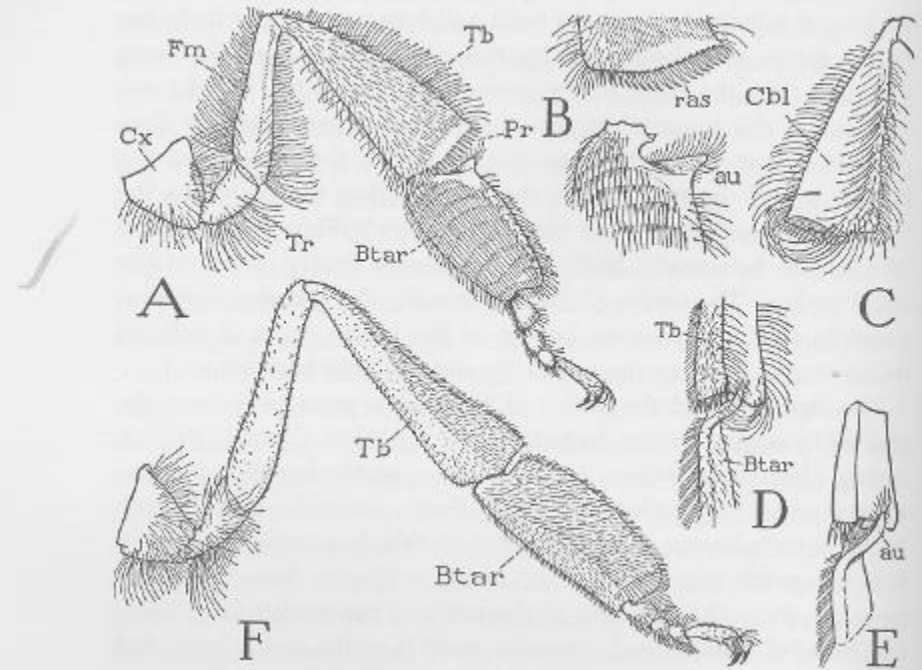
Fig. 44. The wing movements.

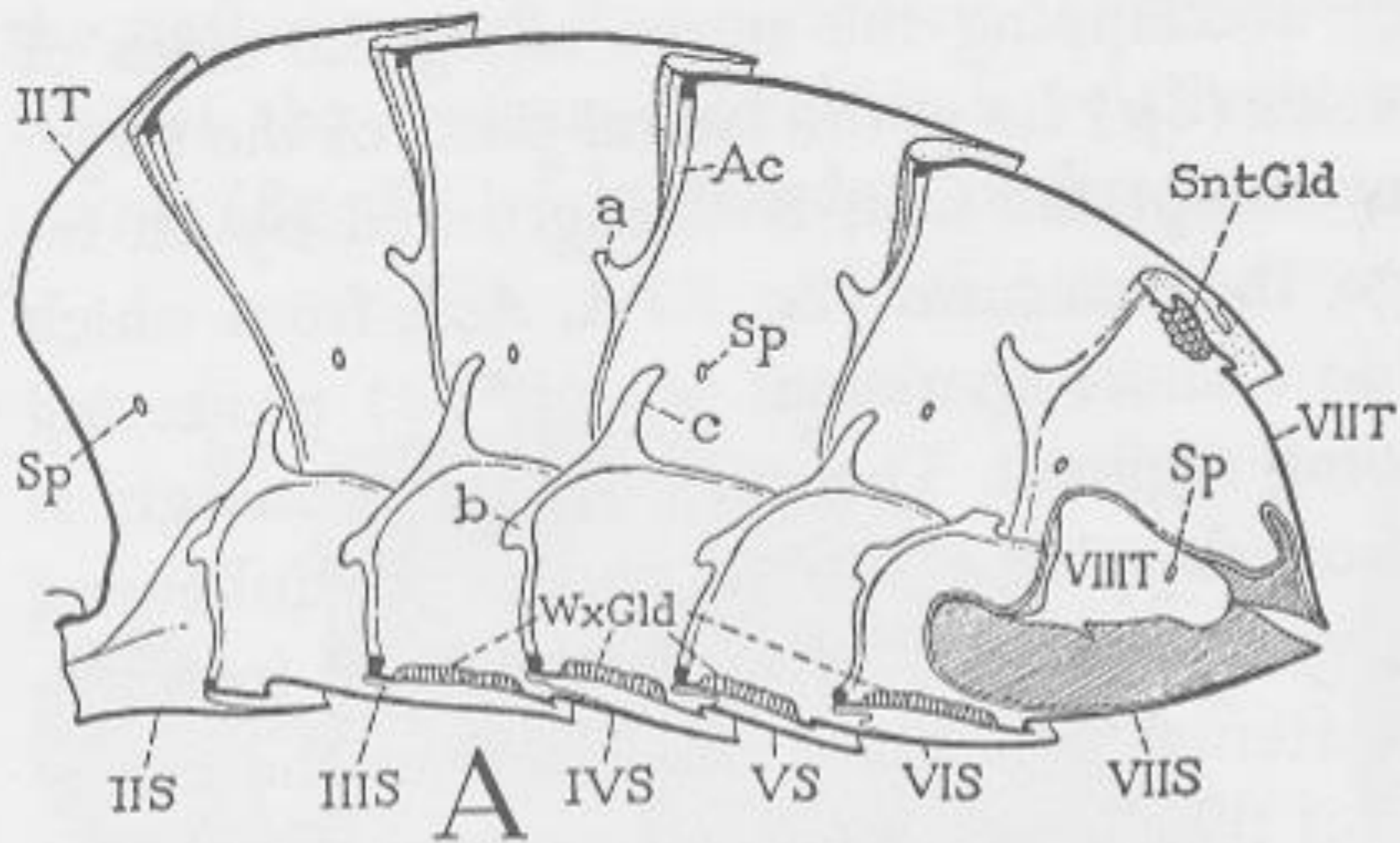


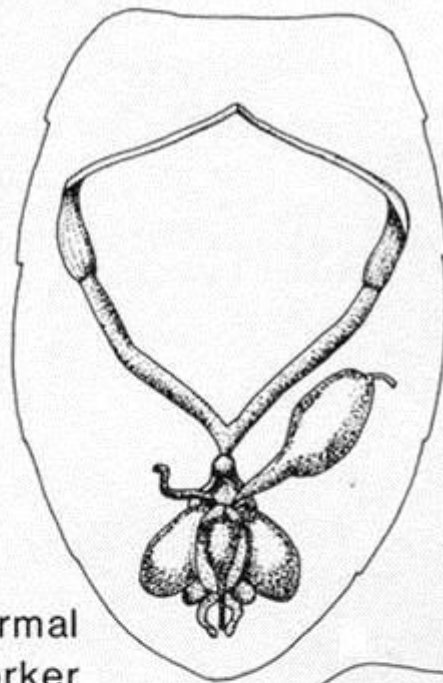
Honey bee hairs are branched



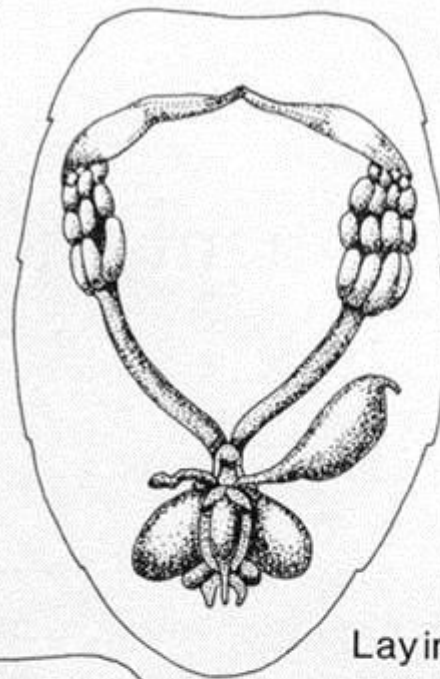
corbiculum opposed to scopa



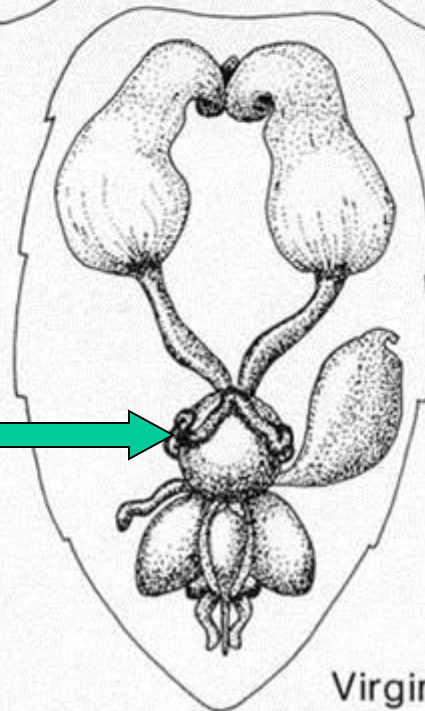




Normal  
Worker

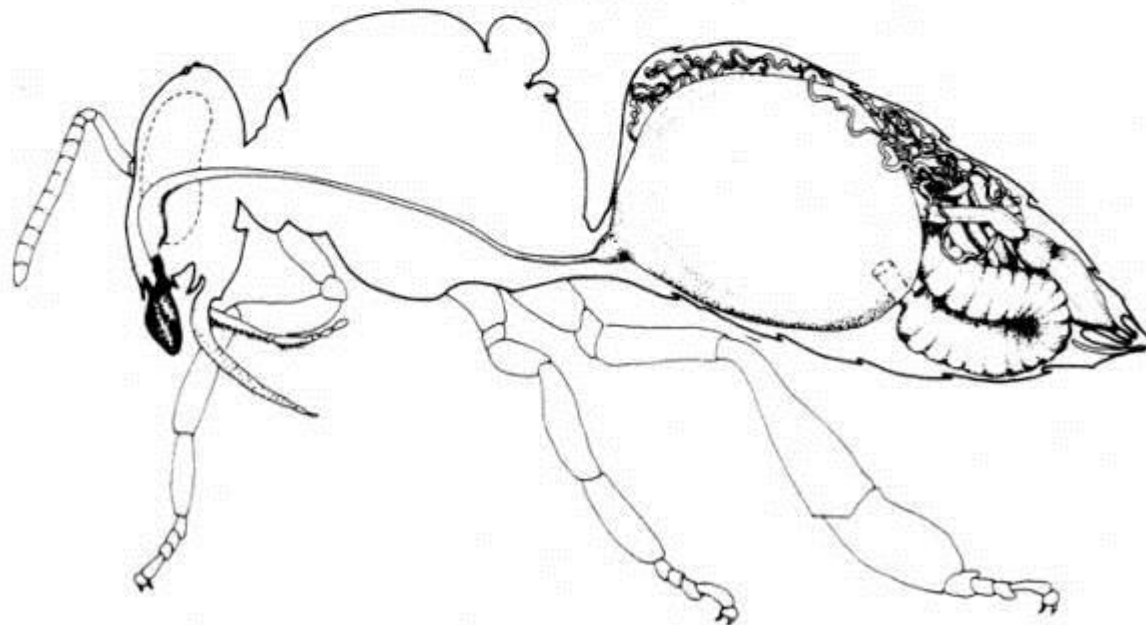
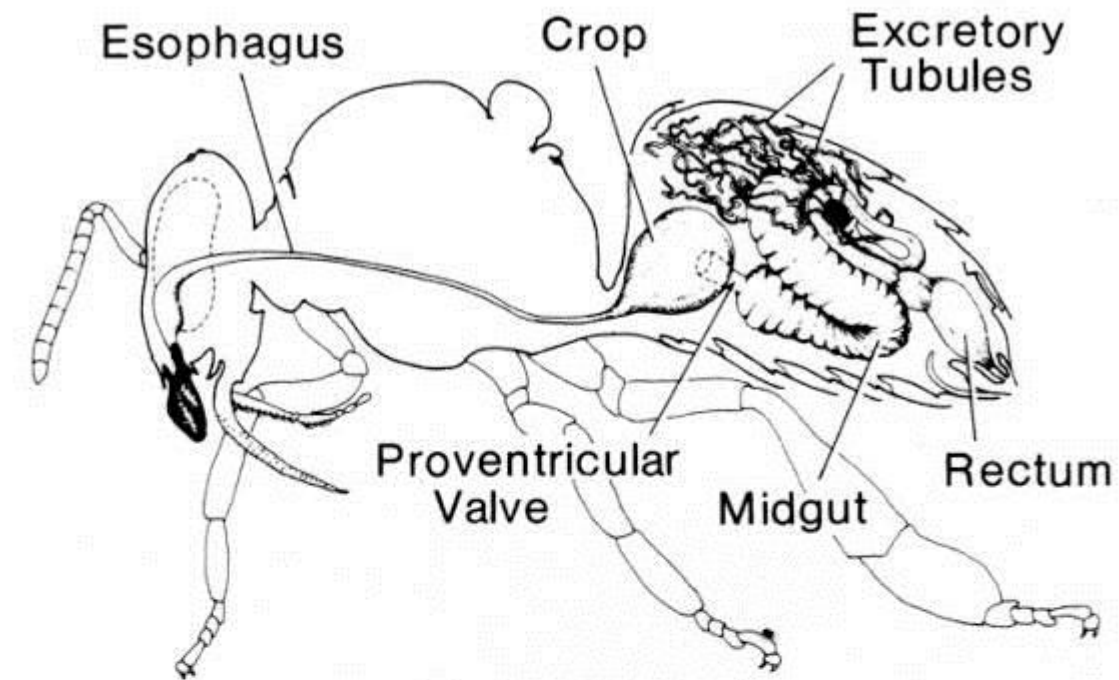


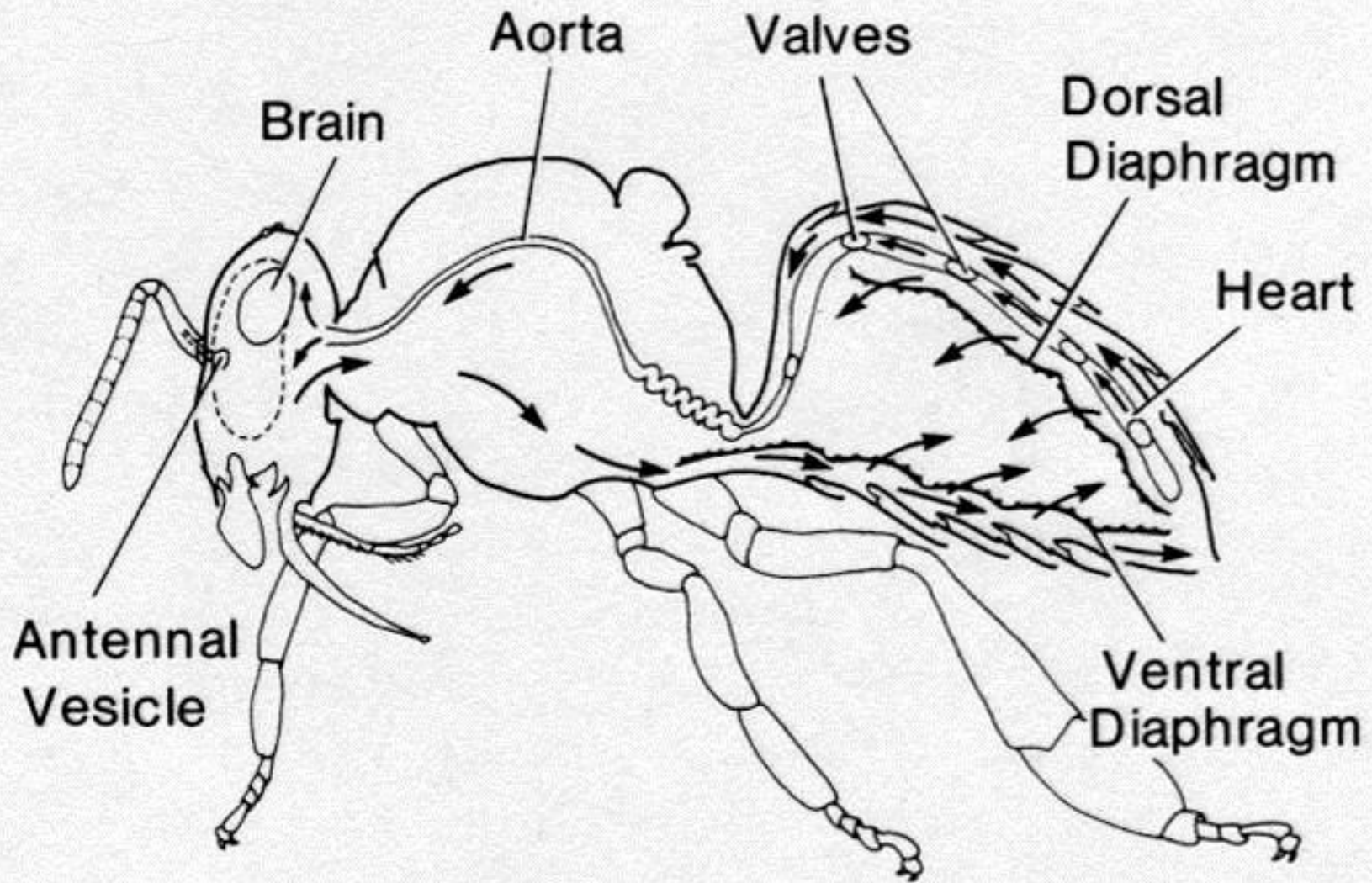
Laying  
Worker

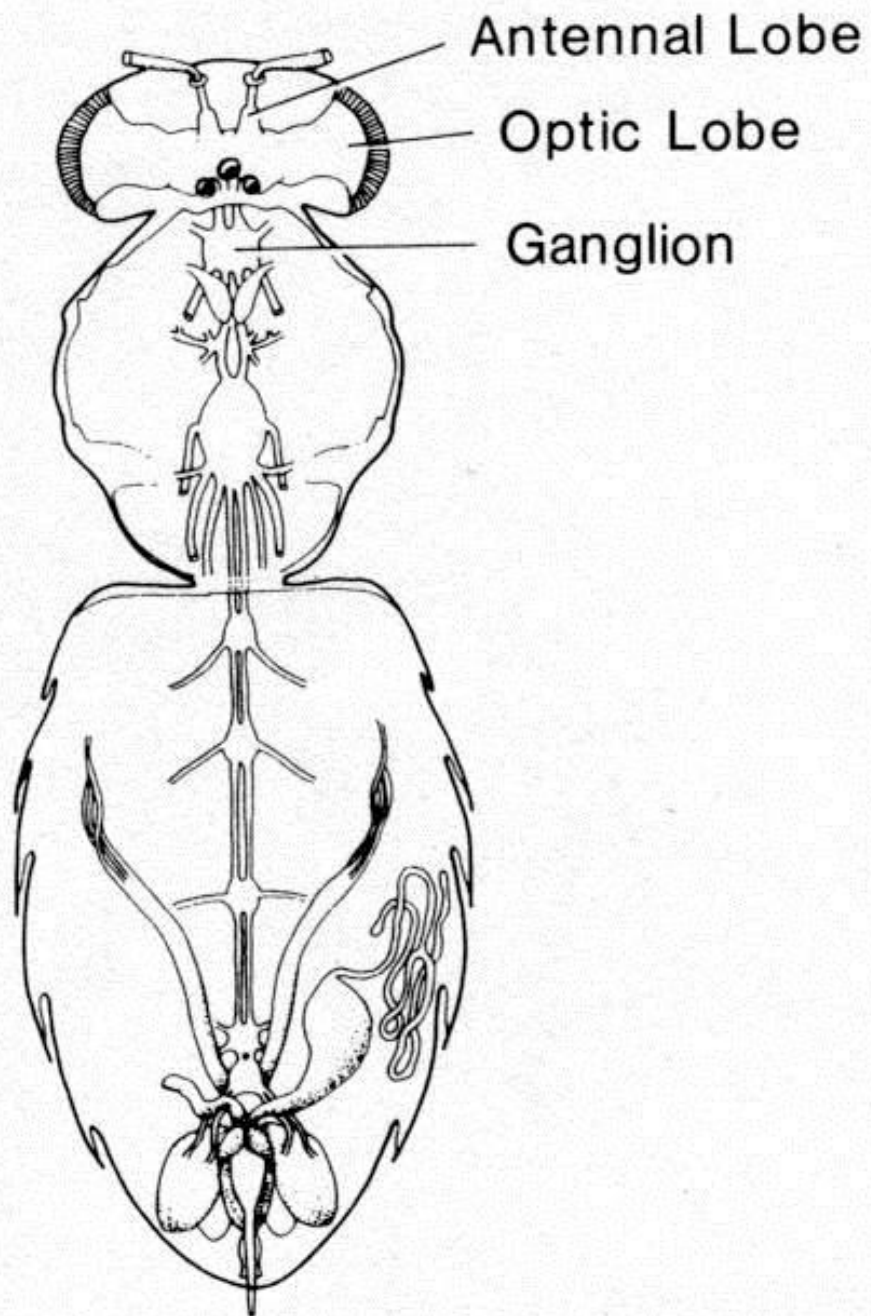


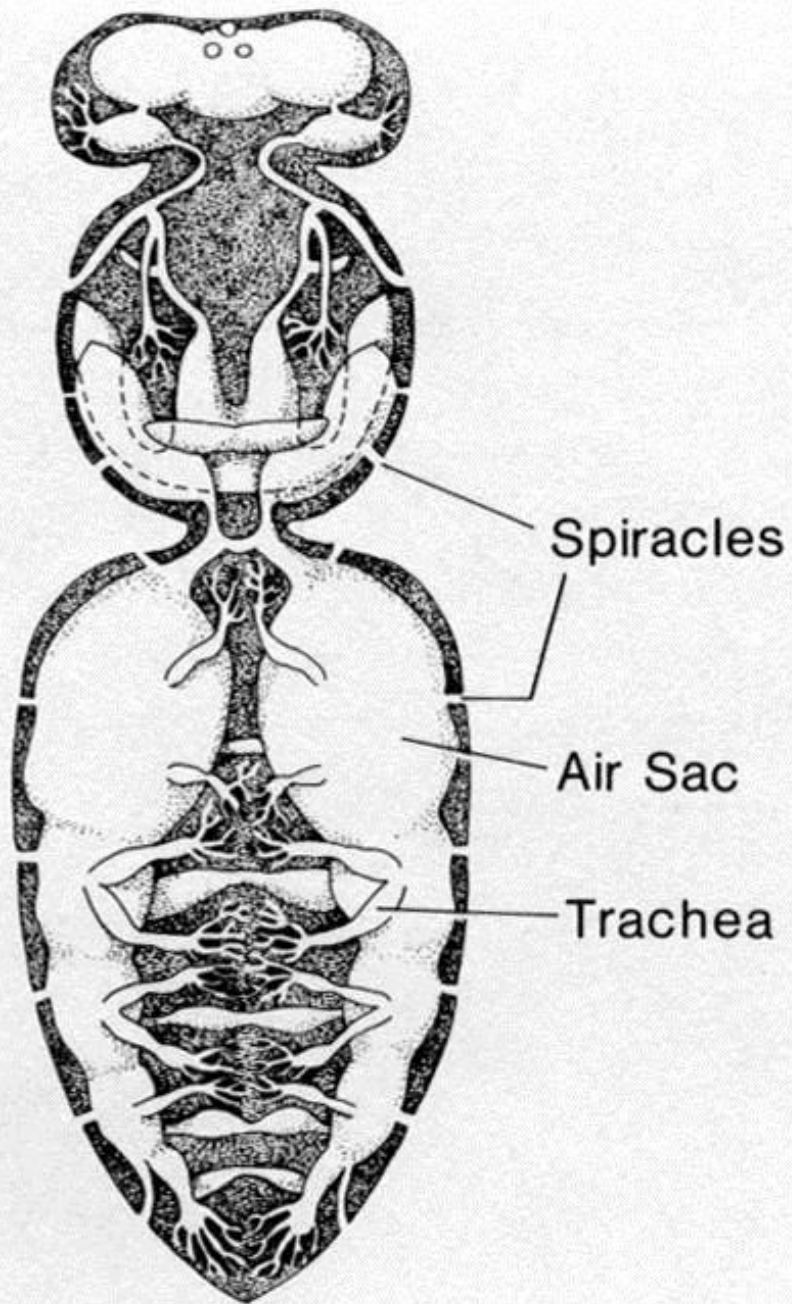
spermatheca

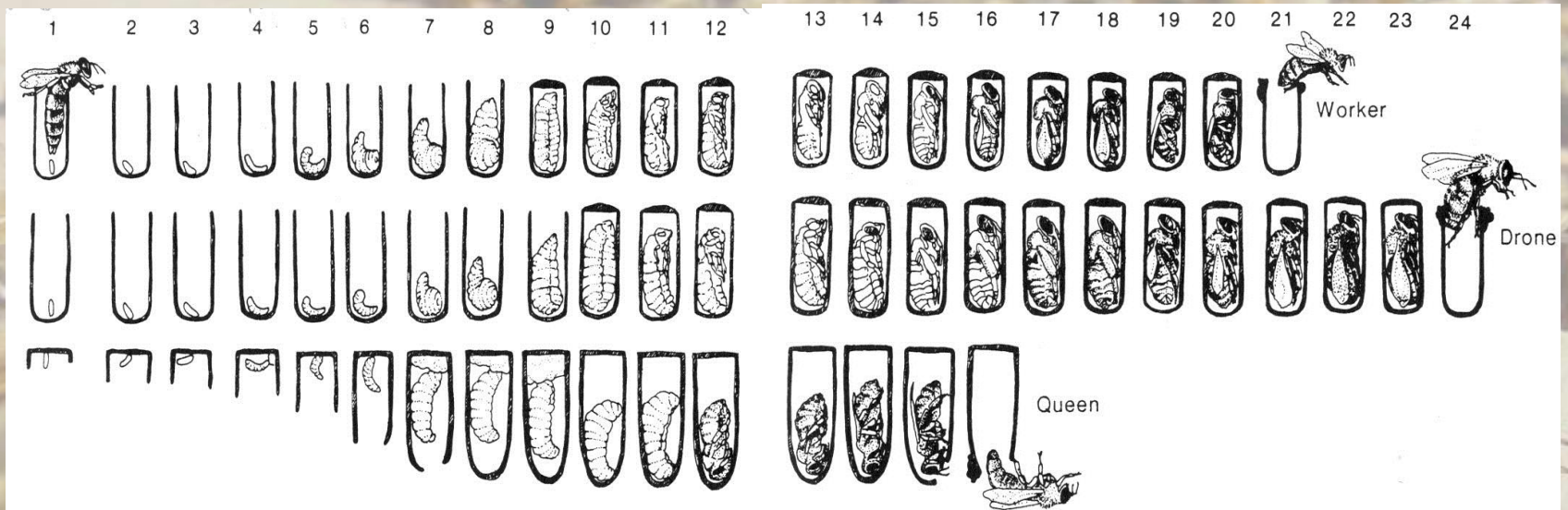
Virgin Queen











Complete metamorphosis, development times differ



egg

fertilized?

not

male

well-fed?

not

queen

worker

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*Apis florea*

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*Apis dorsata*



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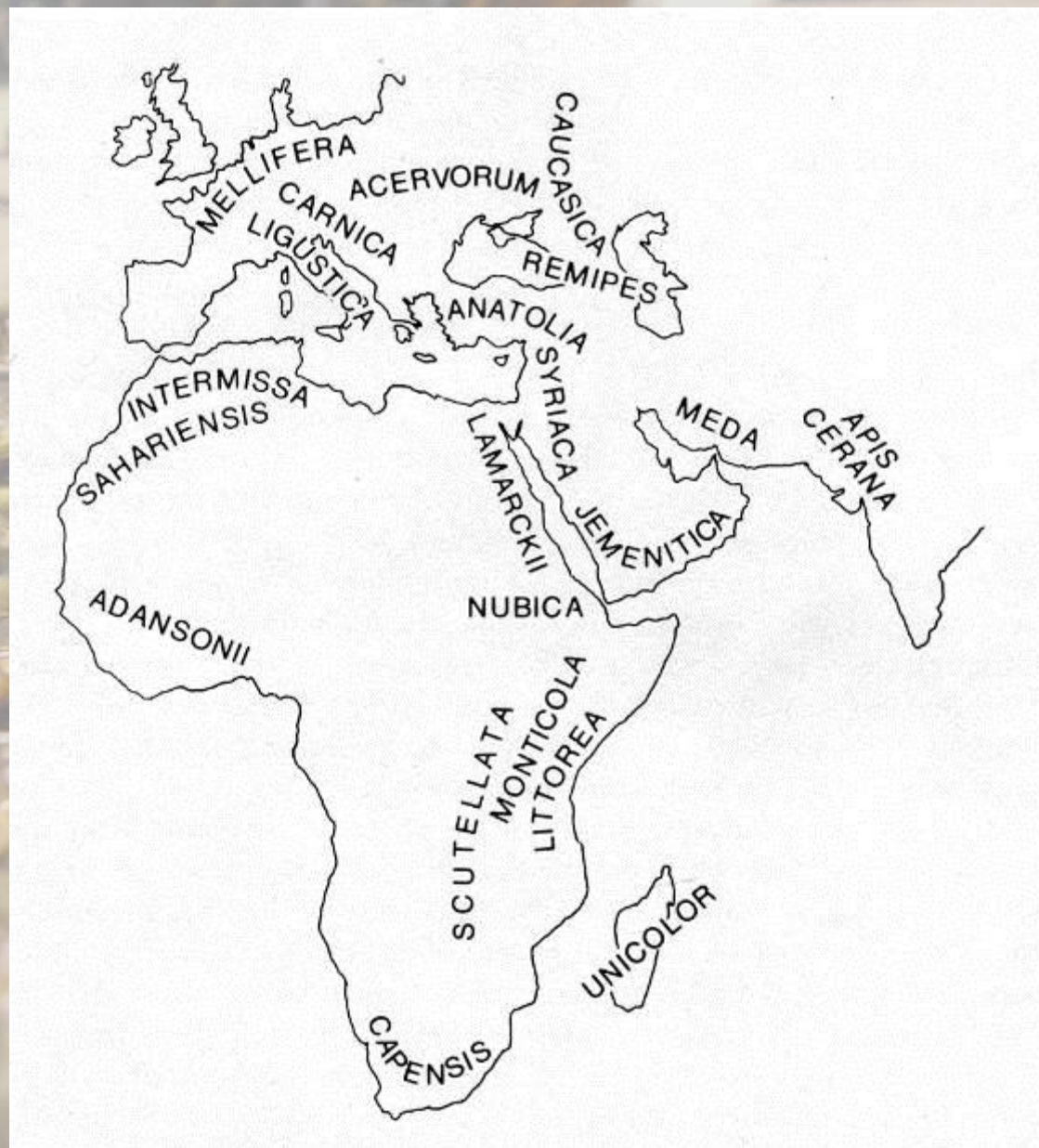
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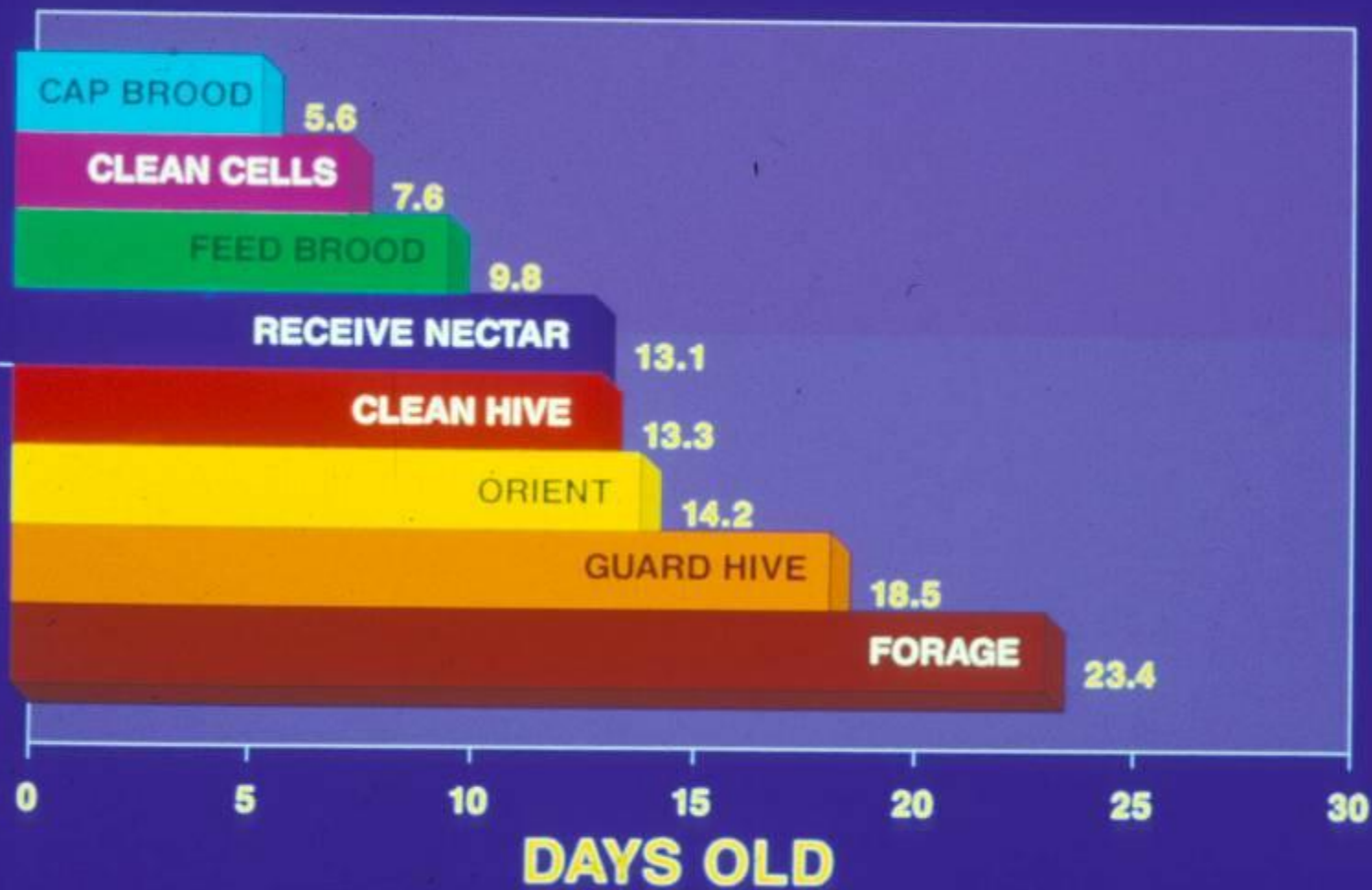
40 liters

# *Apis mellifera* spp.





# AS A BEE AGES . . .





Nasonov

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Isoamyl acetate

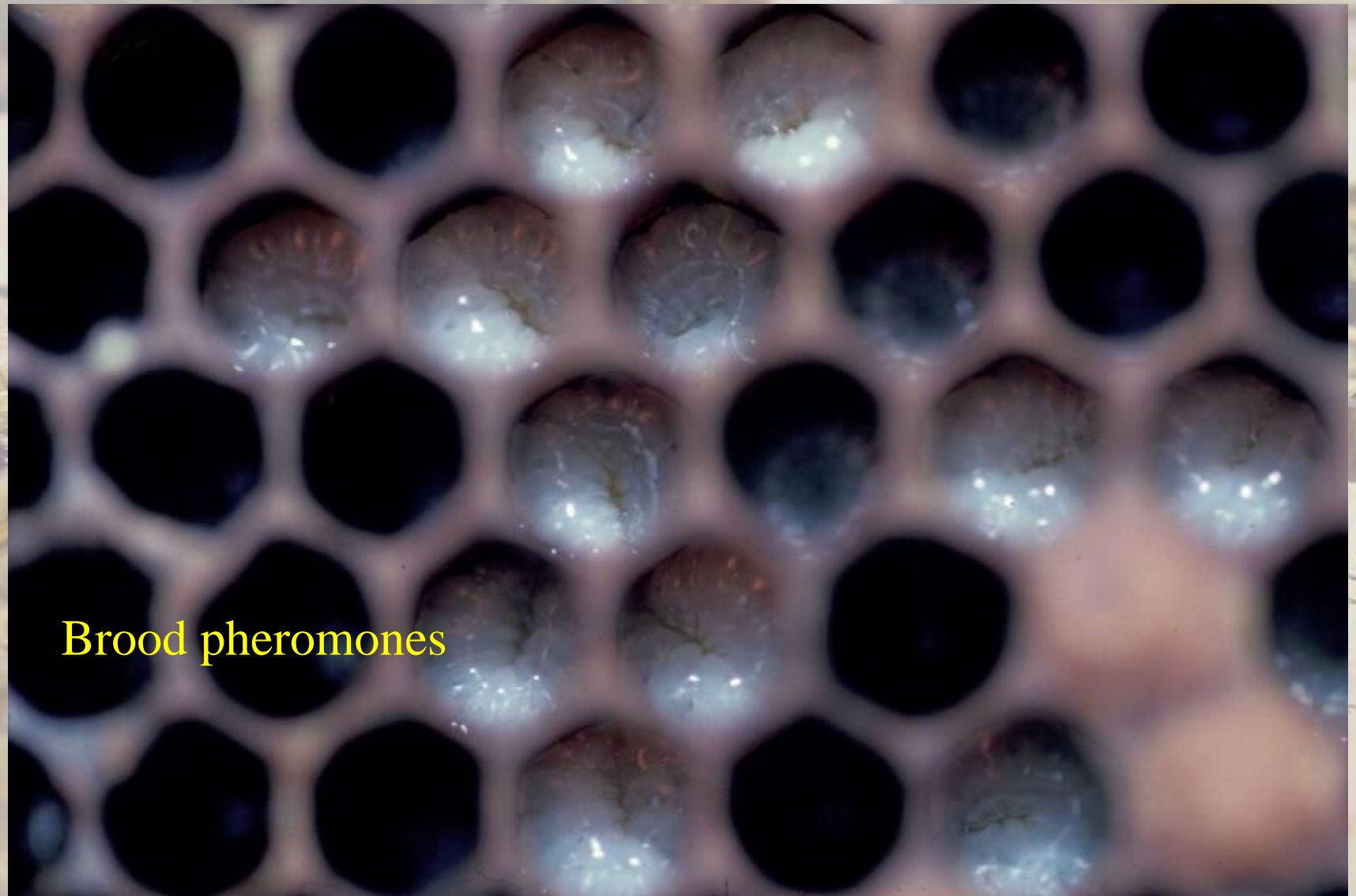
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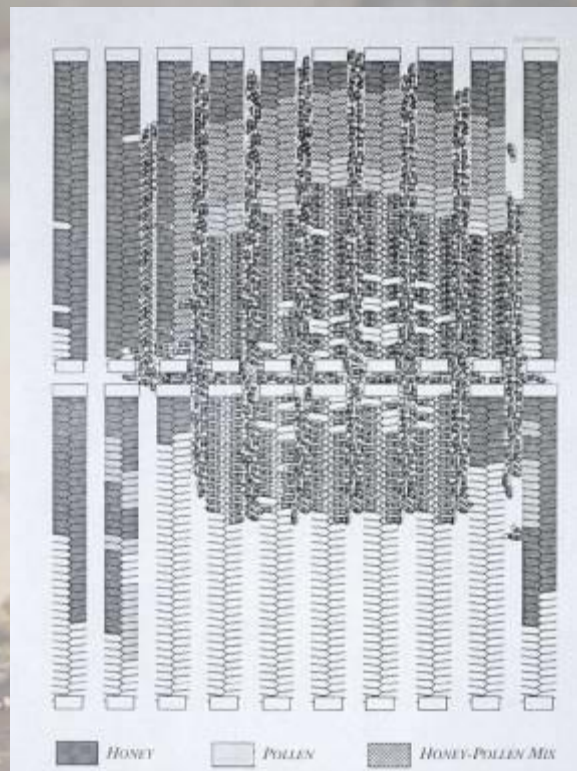


9-oxodecenoic acid (9-ODA)

9-hydroxy-(E)-2-decenoic acid (9-HDA)

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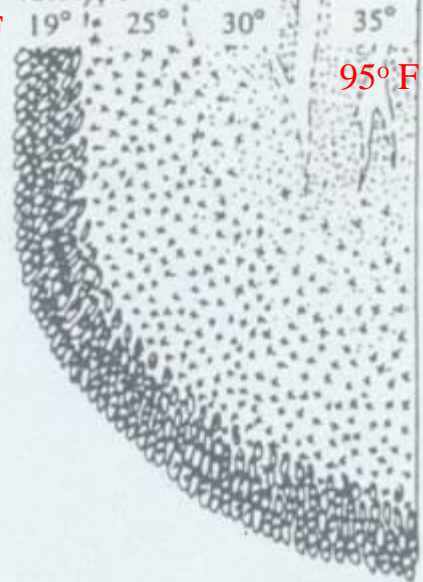




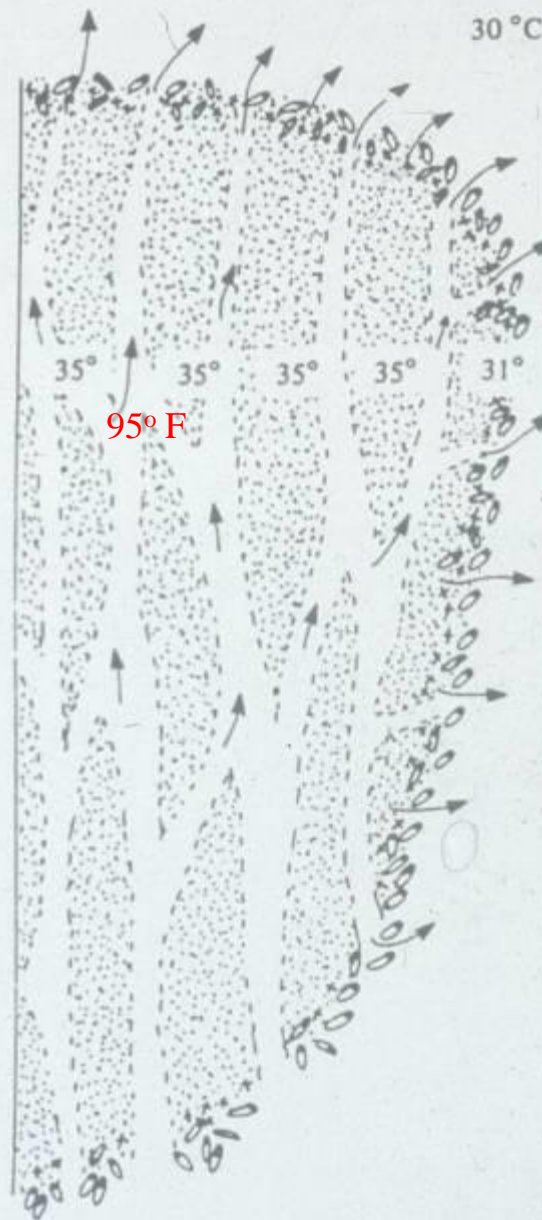
41° F 5 °C

30 °C 86° F

66° F



95° F



95° F

88° F

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