

# Honey bee biology

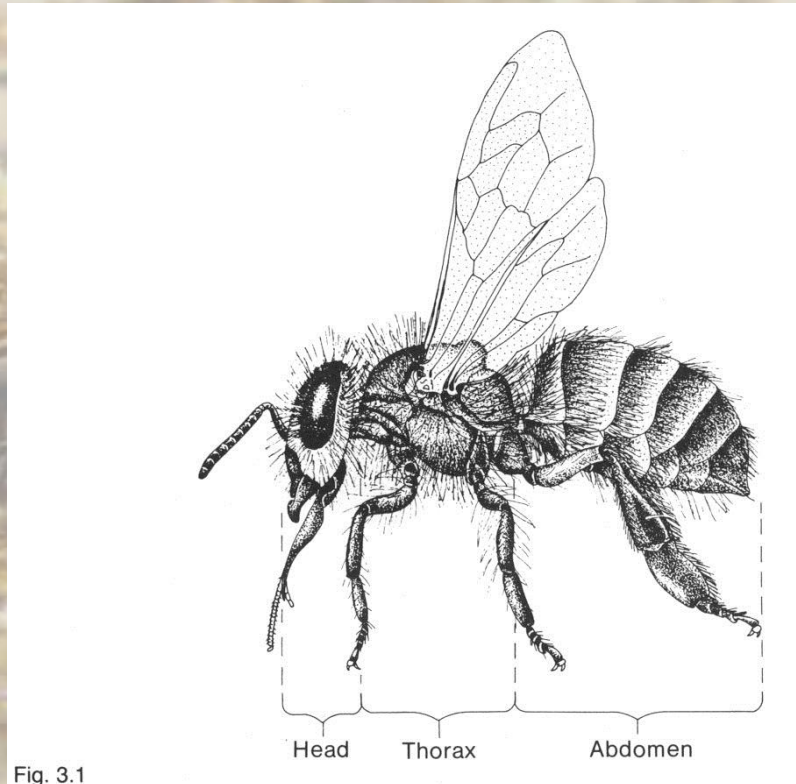
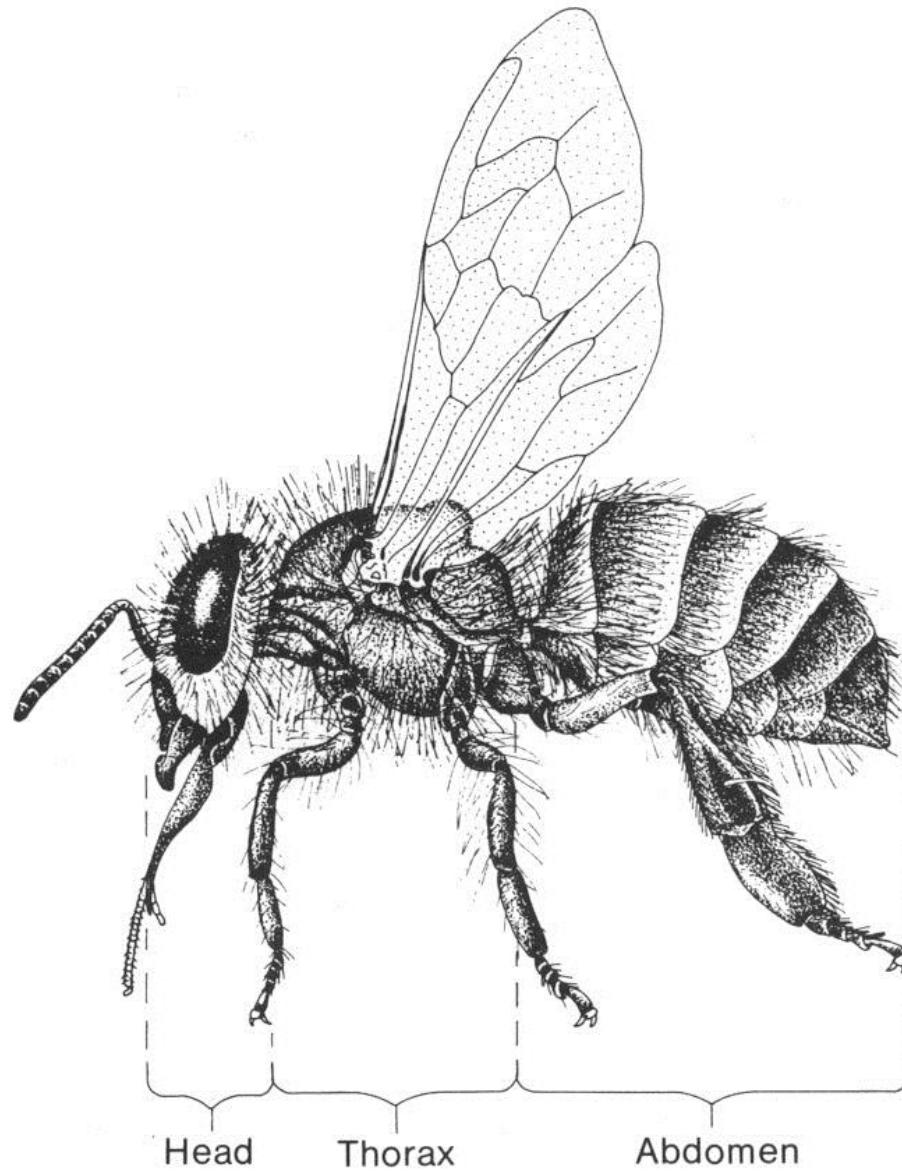


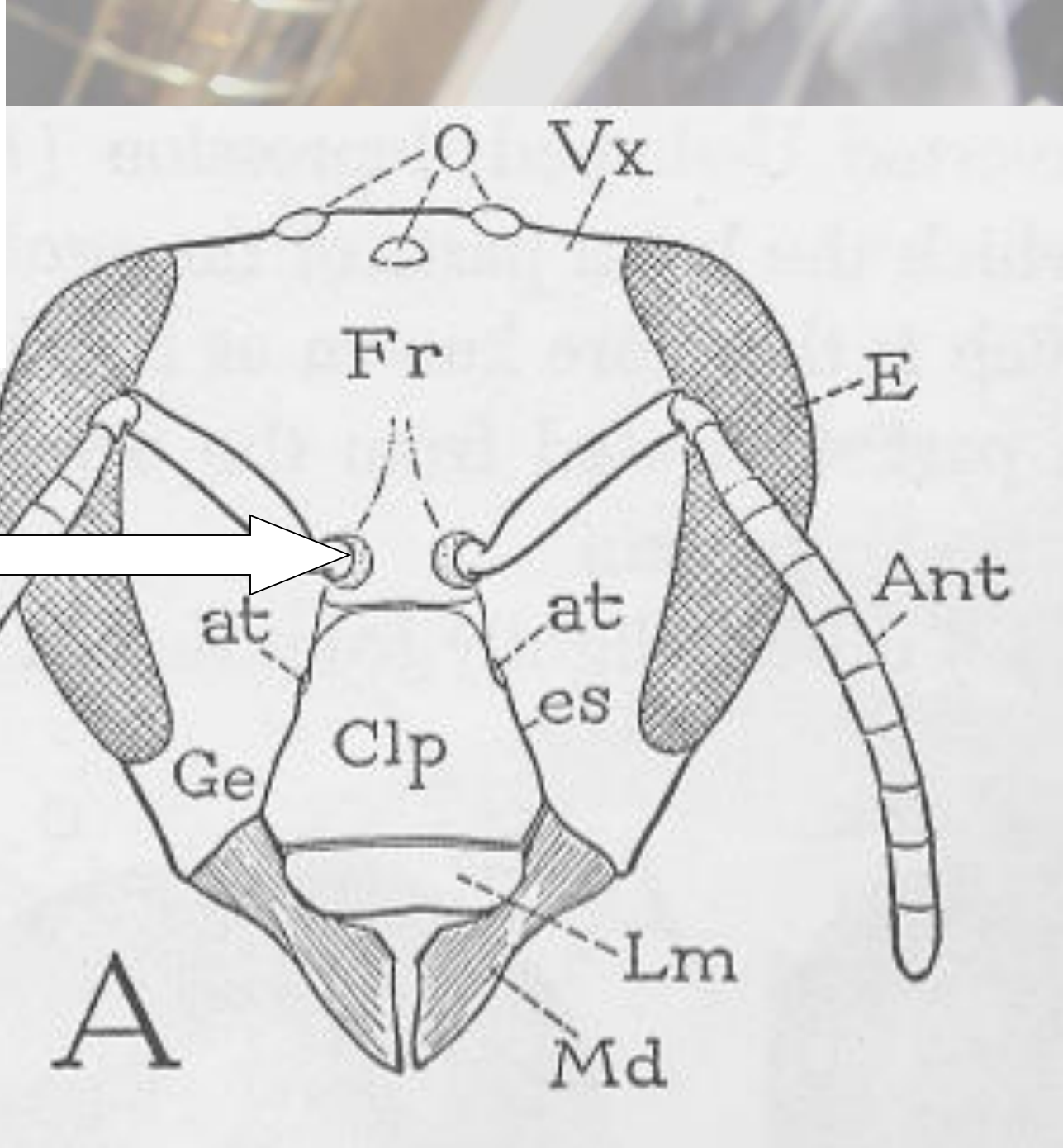
Fig. 3.1

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**Honey Bee Research and Extension Laboratory**  
**University of Florida**

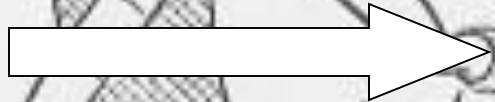
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Epidermis + cuticle = integument



Johnston  
Organ



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

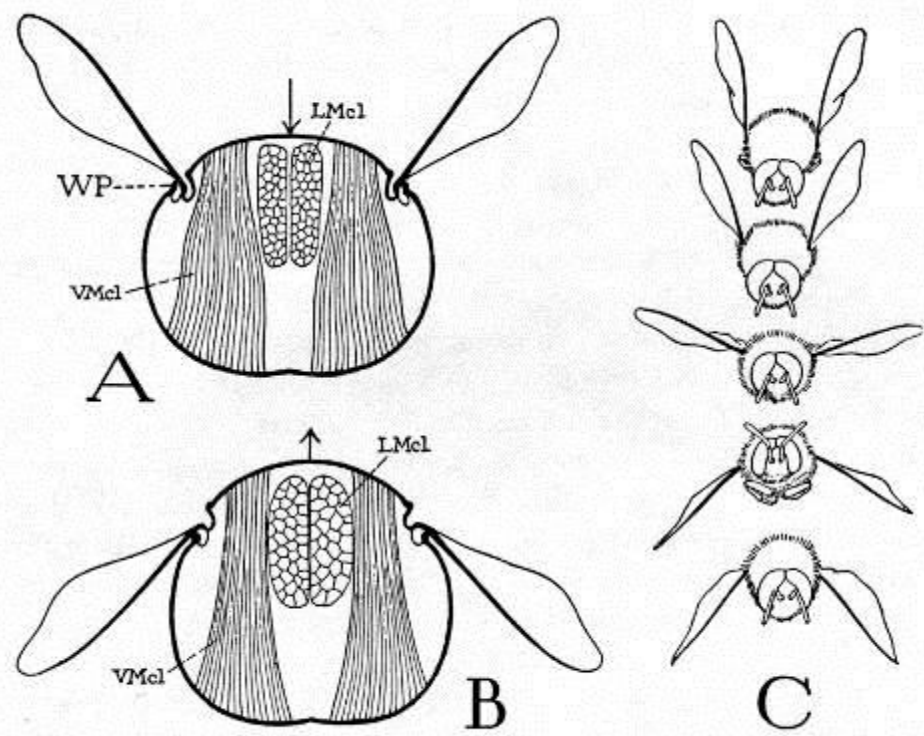
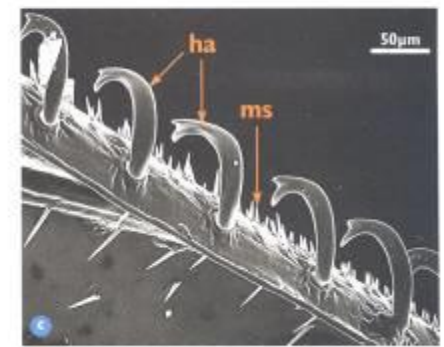
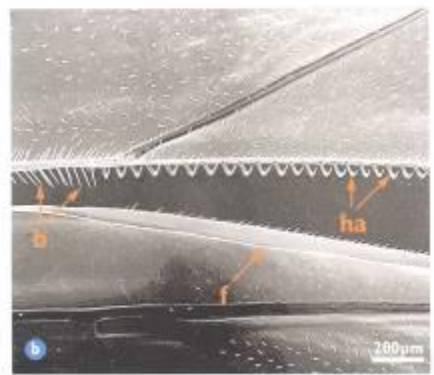
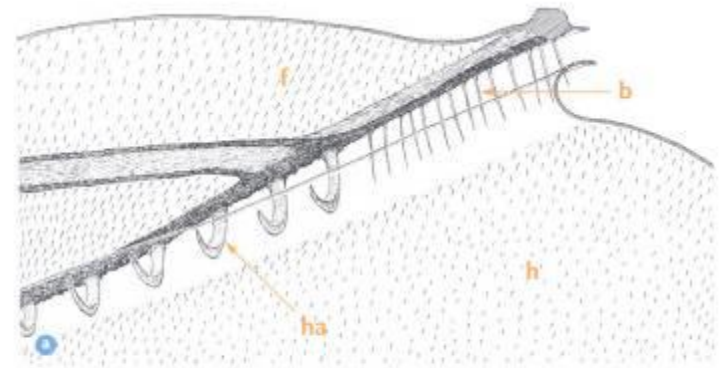


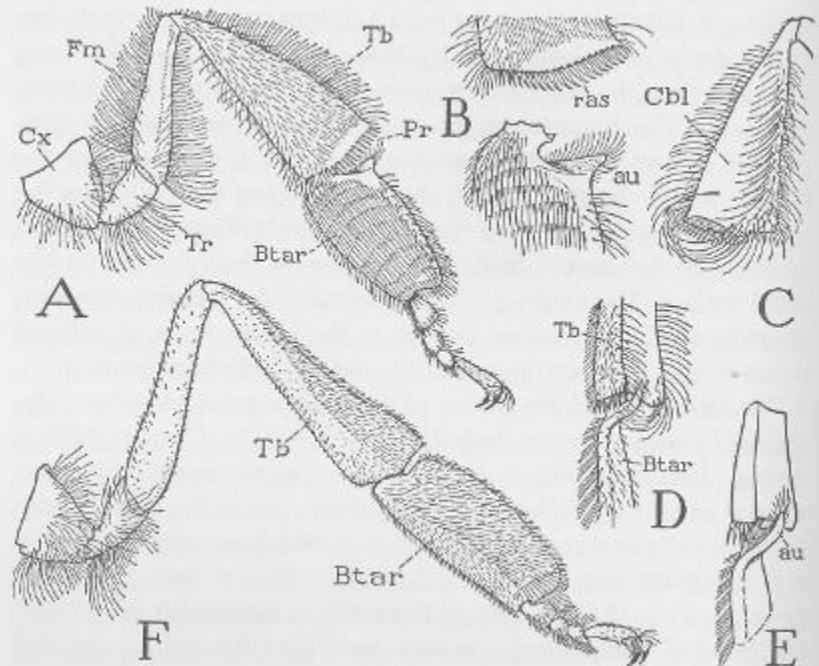
Fig. 44. The wing movements.

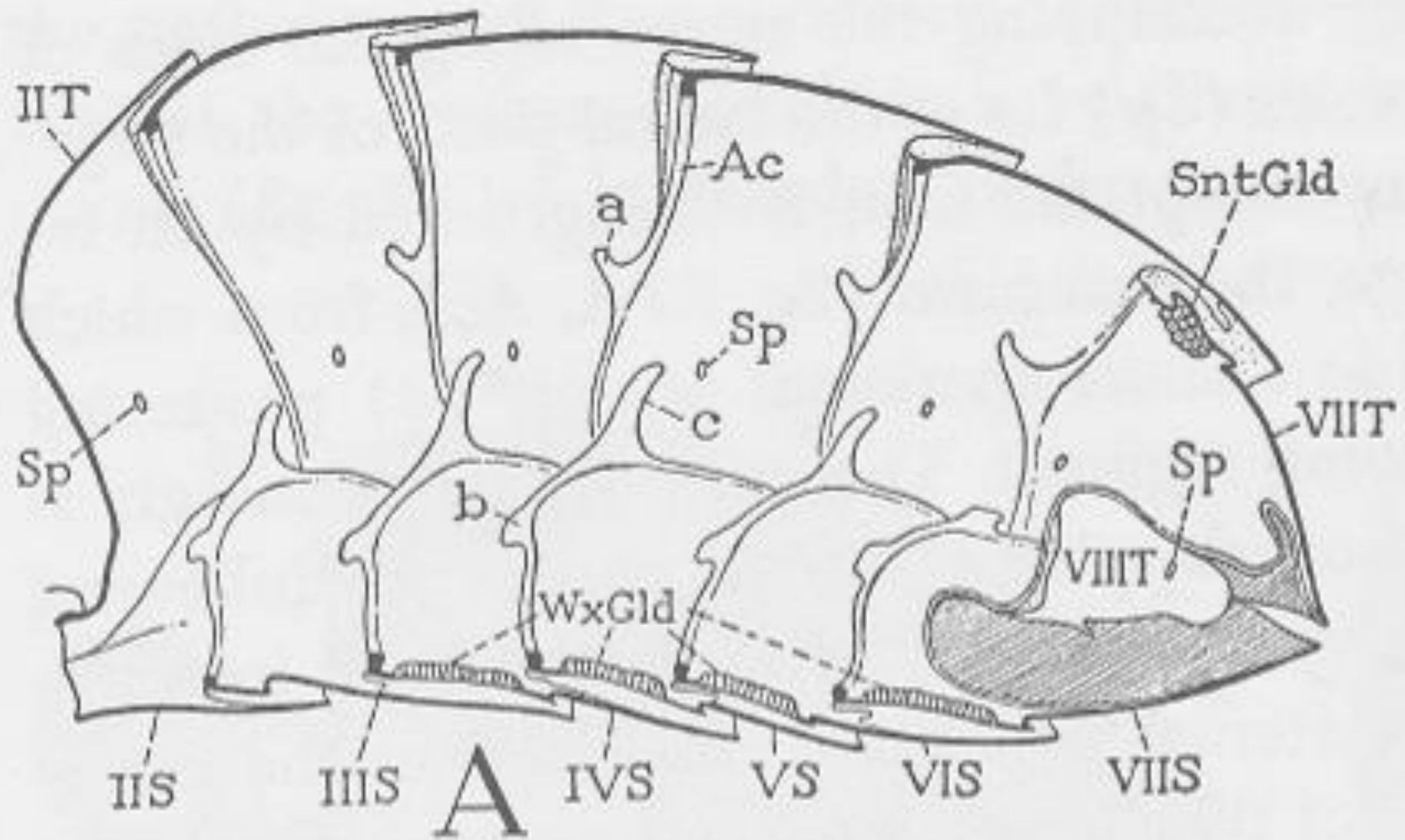


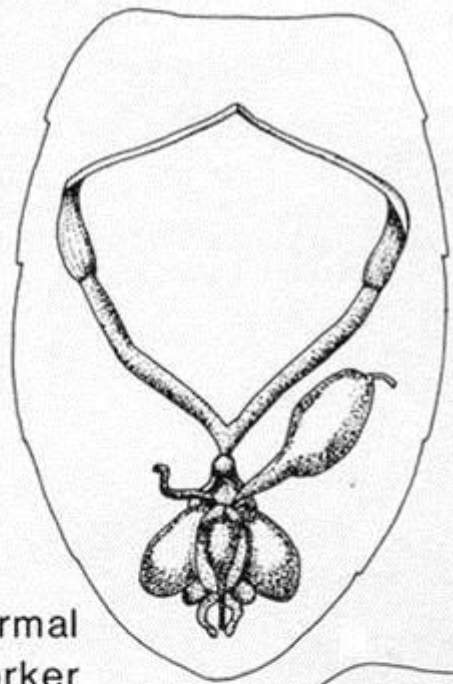
Honey bee hairs are branched



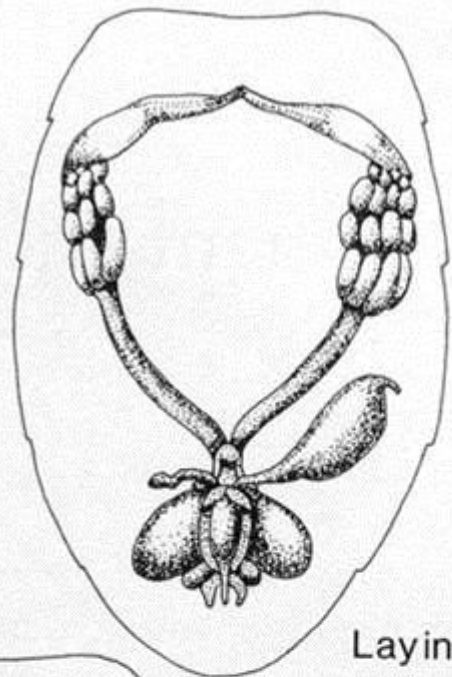
corbiculum opposed to scopa



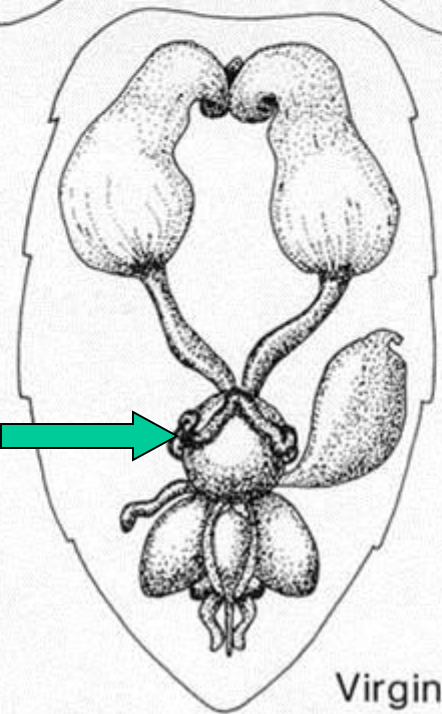




Normal Worker

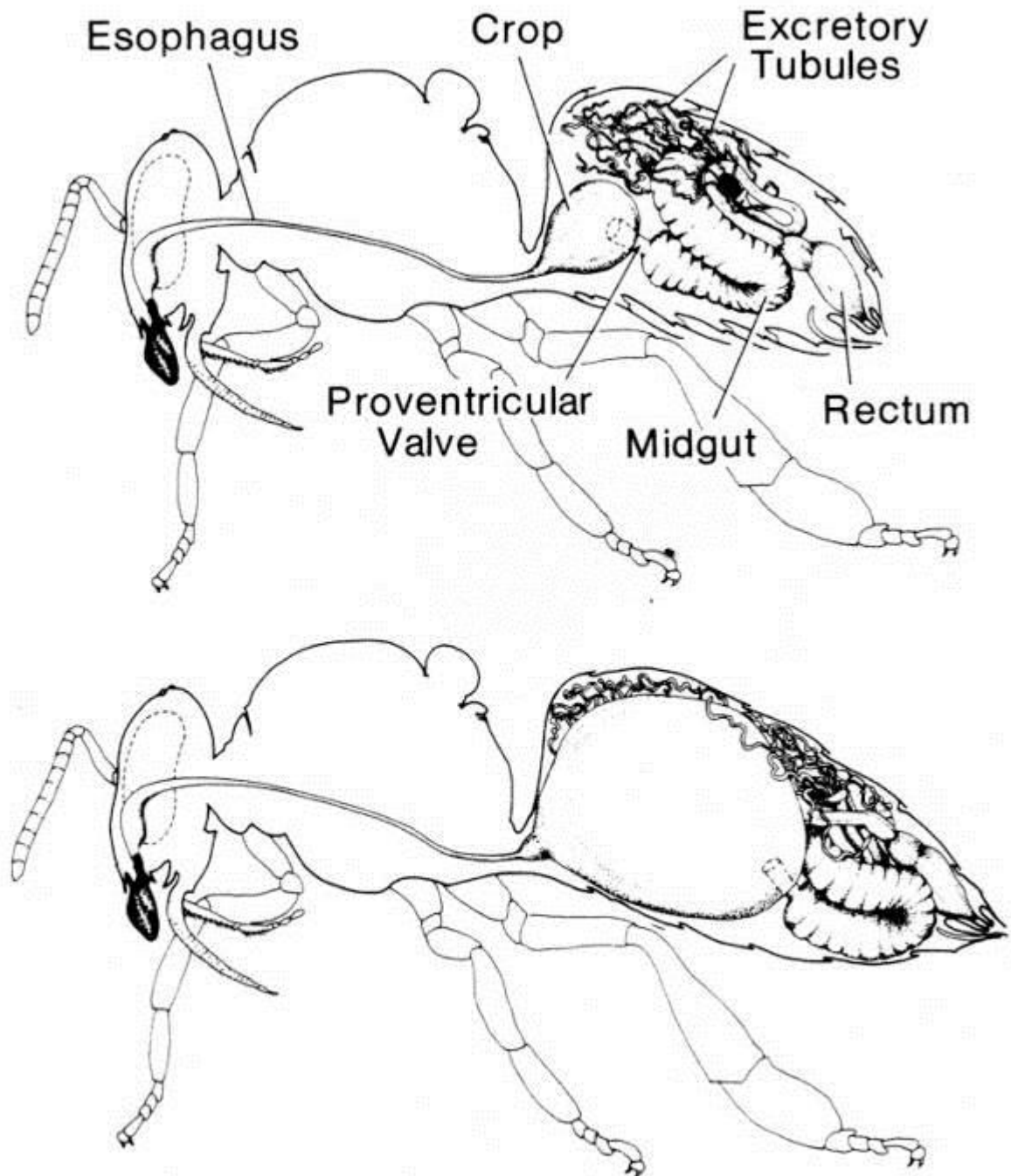


Laying Worker

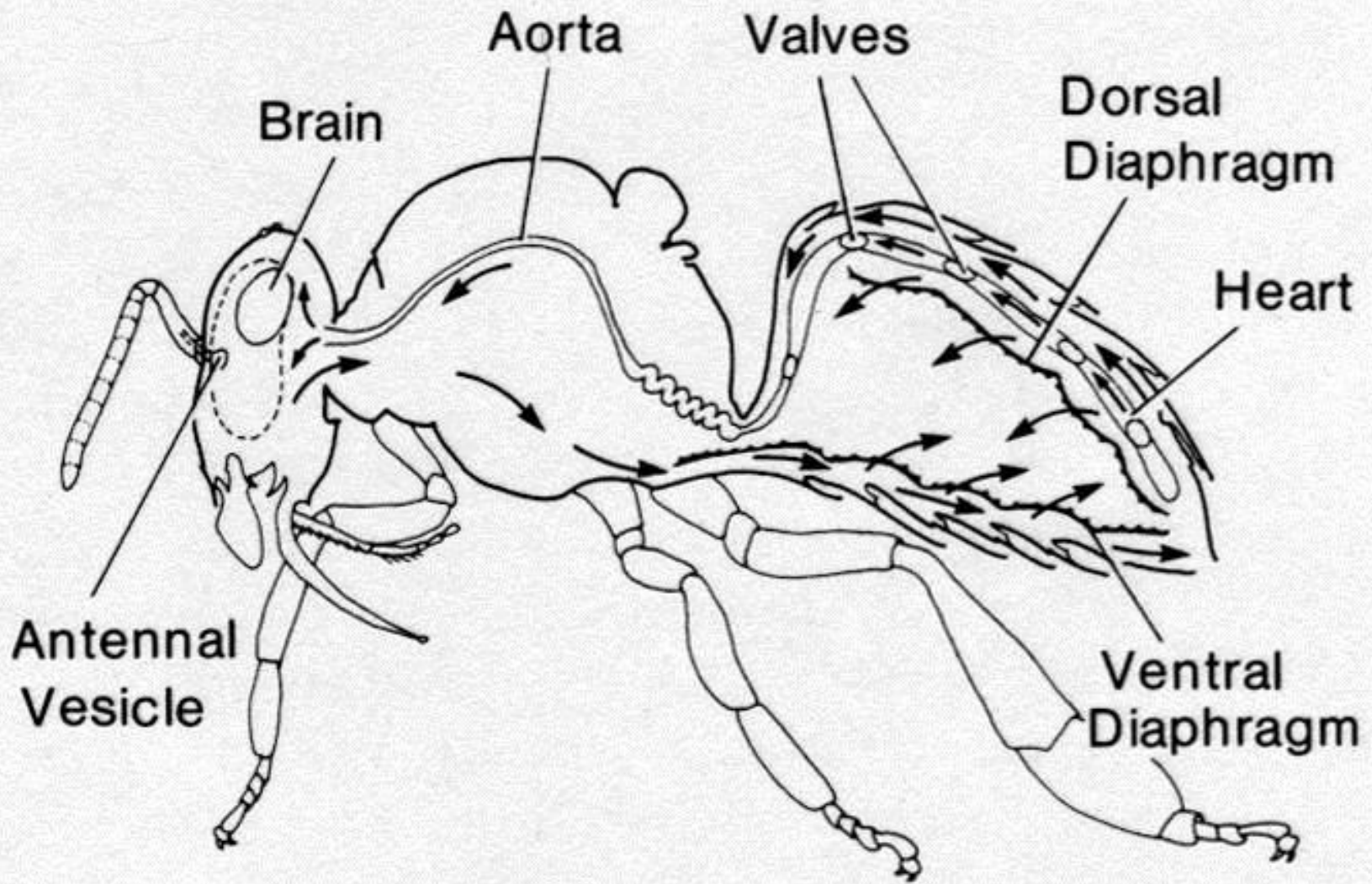


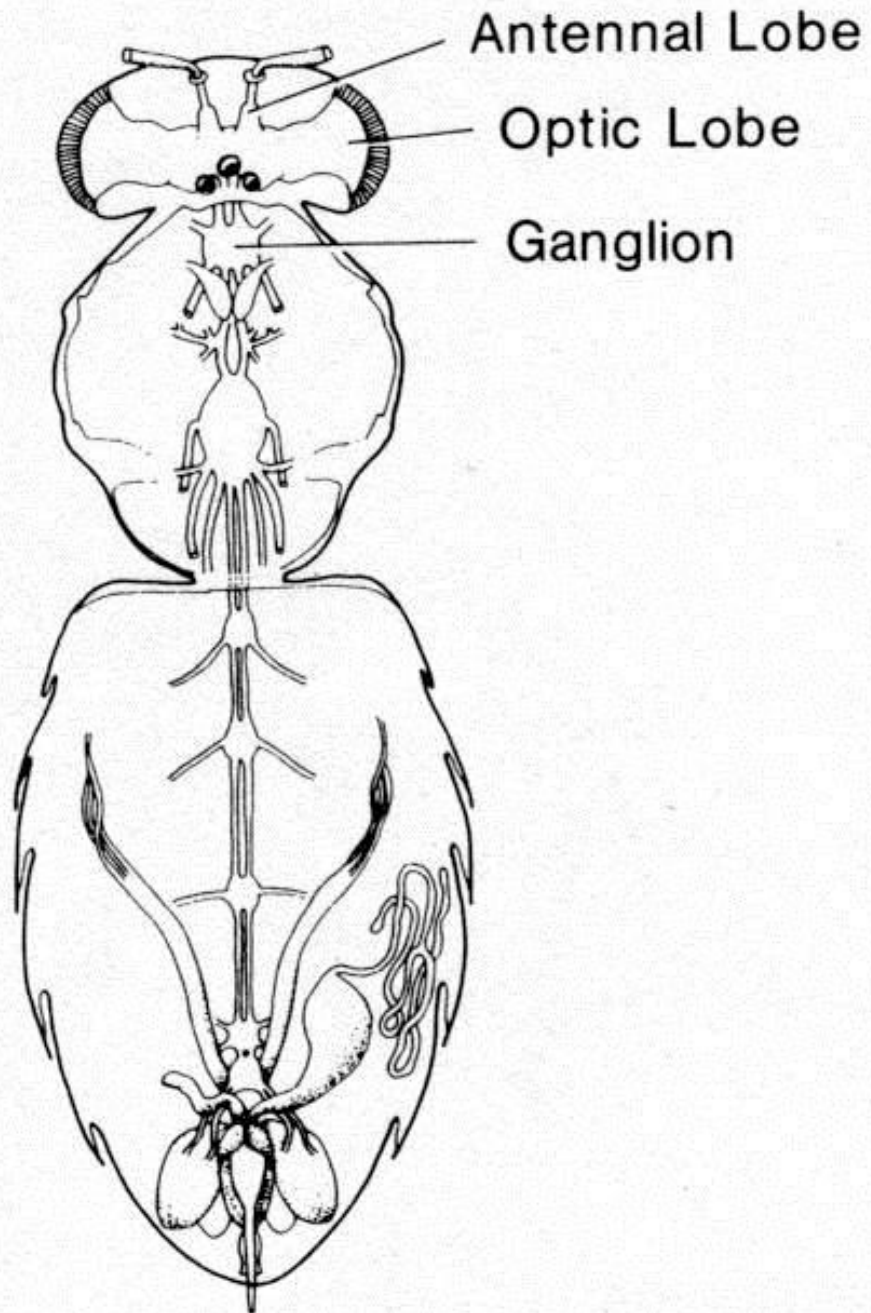
spermatheca

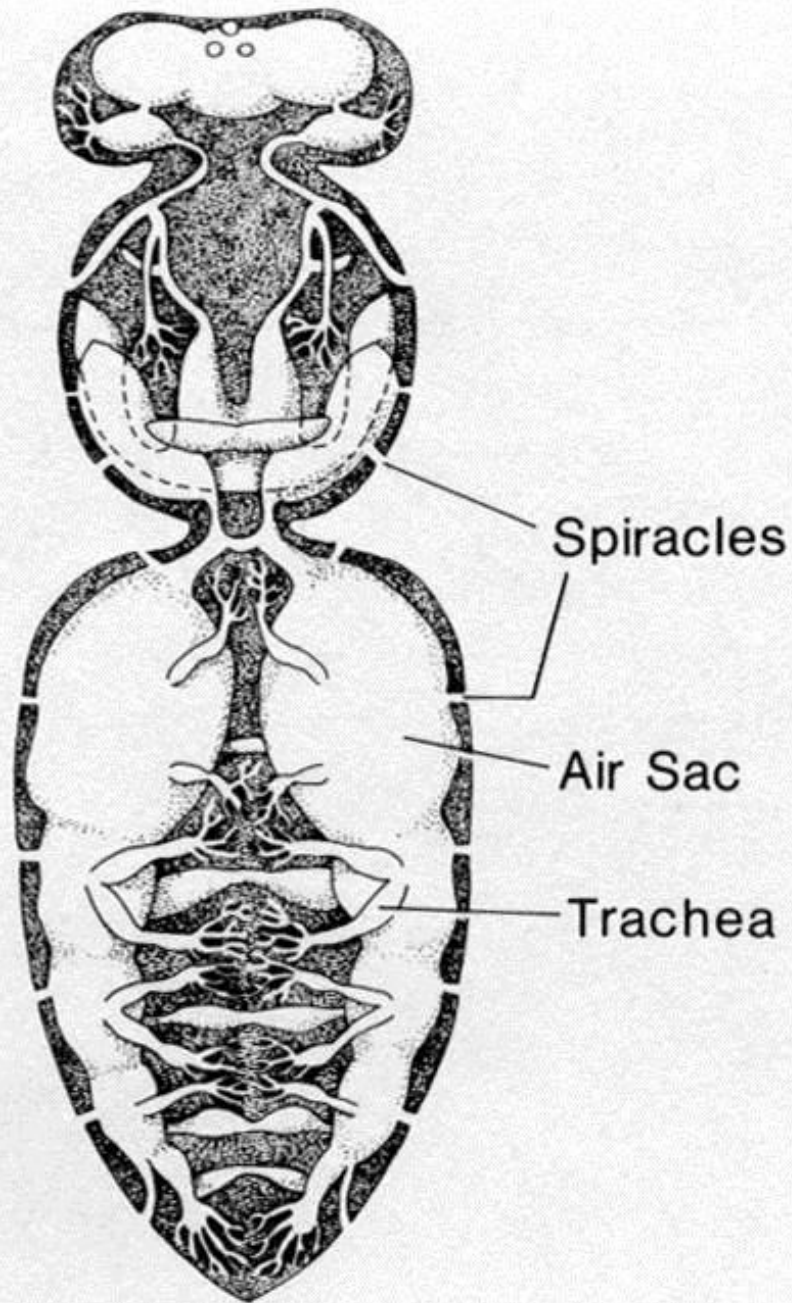
Virgin Queen

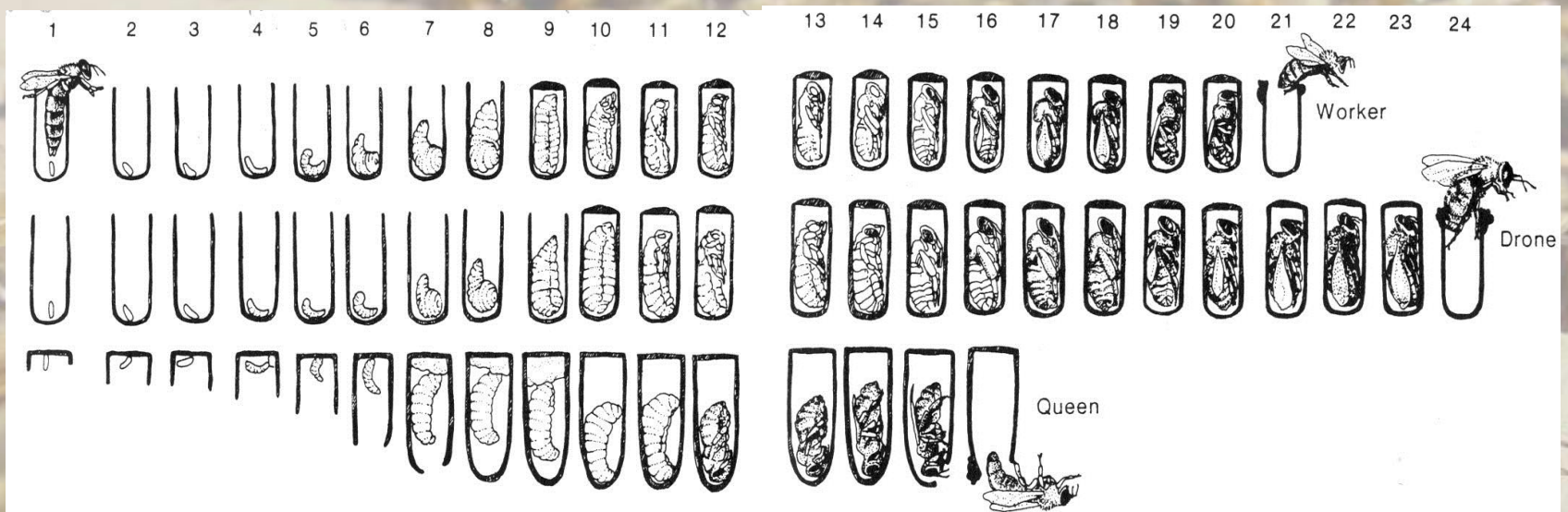












Complete metamorphosis, development times differ



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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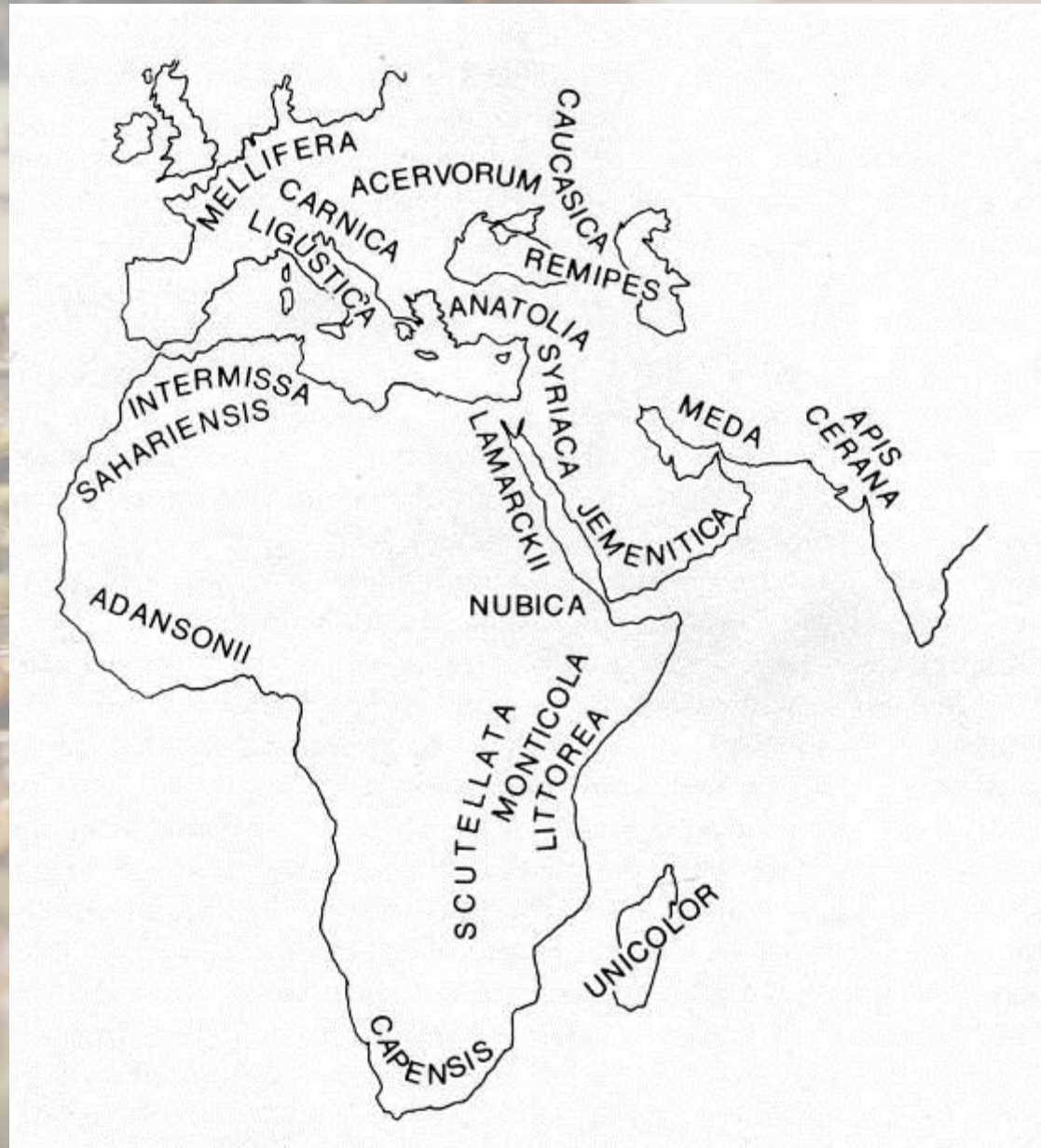
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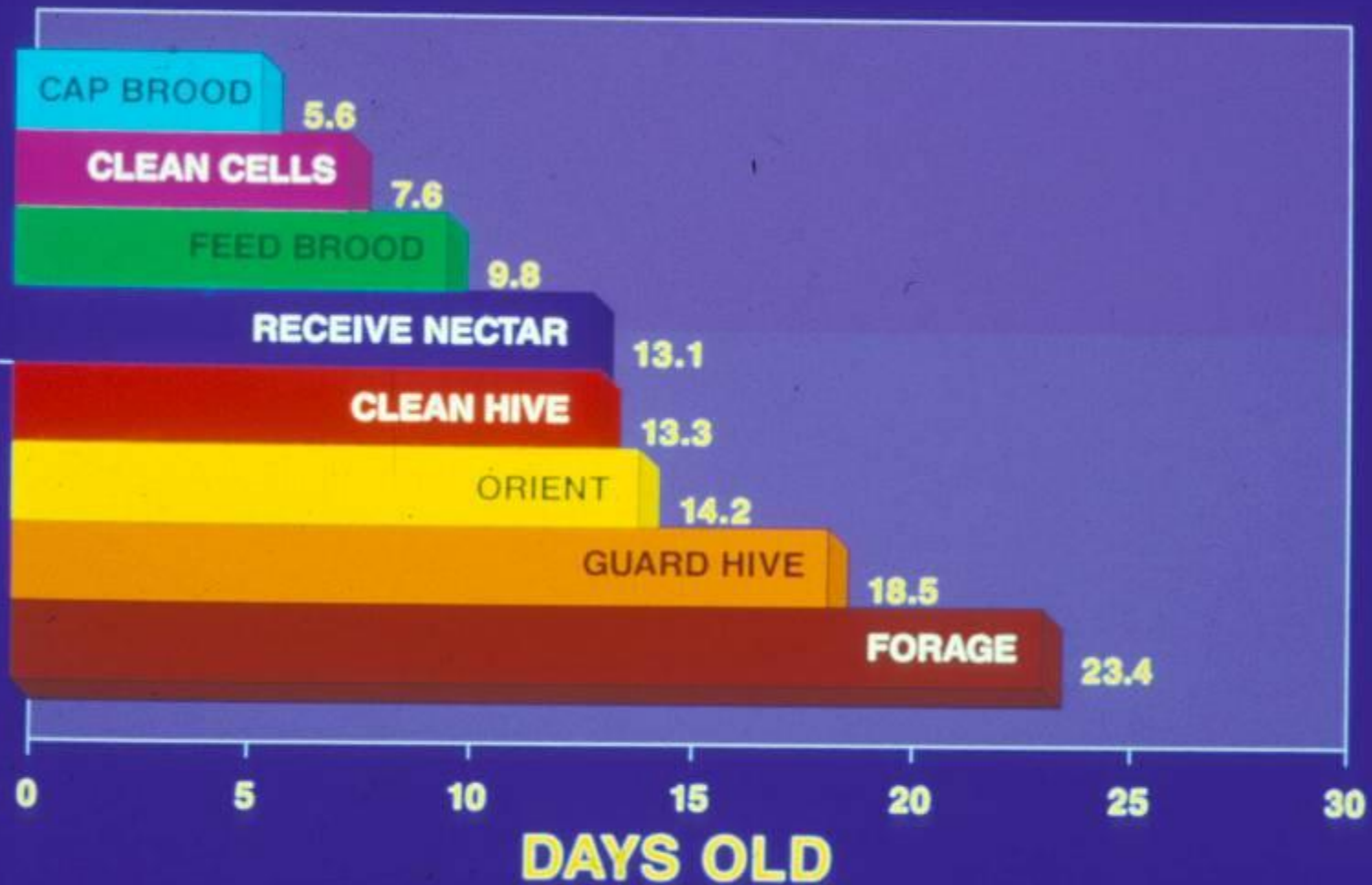
40 liters

# Apis mellifera spp.





# AS A BEE AGES . . .





Nasonov

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footprint





Isoamyl acetate

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9-oxodecenoic acid (9-ODA)

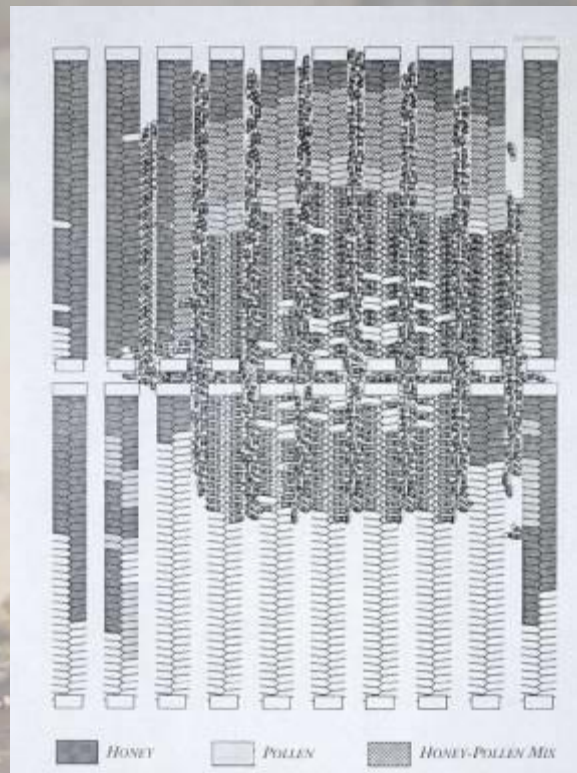
9-hydroxy-(E)-2-decenoic acid (9-HDA)

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**Brood pheromones**

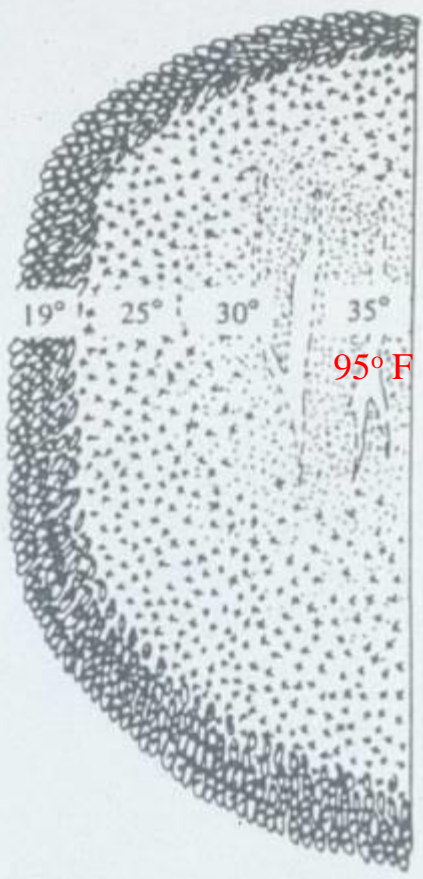
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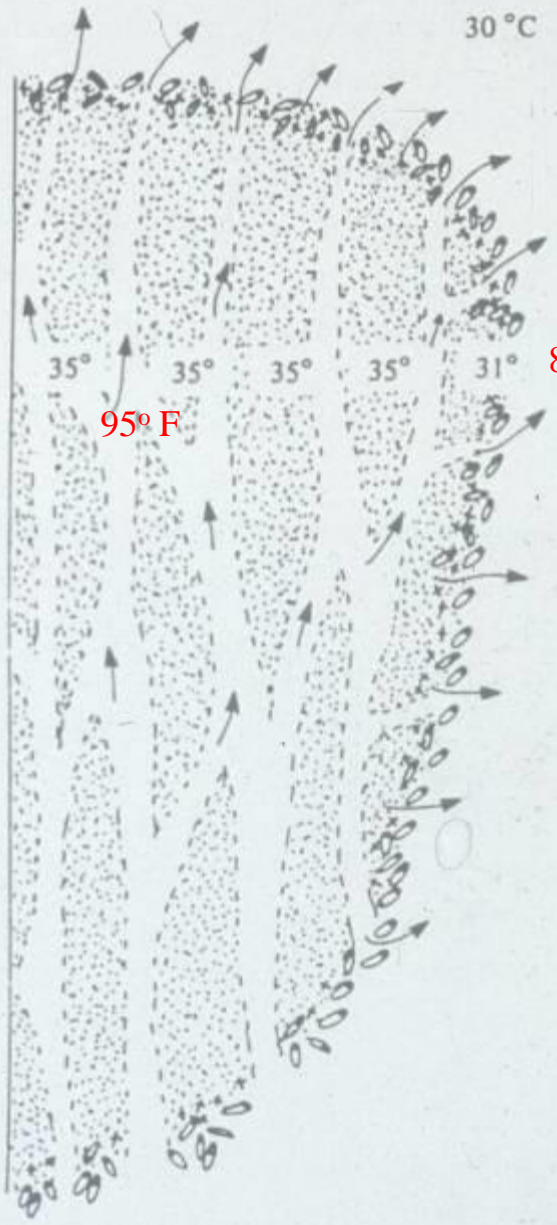
41° F 5 °C

30 °C 86° F

66° F



95° F



95° F

88° F

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2004 12 13







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