

THE AMAZING WORLD OF THE BEES IN OUR GARDENS



Alan Baxter
Cornell University Master Beekeeper









Solitary bees

Social bees

Honey bees



WOOL CARDER BEE



TAWNY MINING BEE



RED MASON BEE



LEAF CUTTER BEE



HOVERFLY







ASIAN HORNET OR YELLOW-LEGGED ASIAN HORNET

Bumblebees

24 species in Britain + 2 extinct

**7 species widespread across most of
the country**



Queen

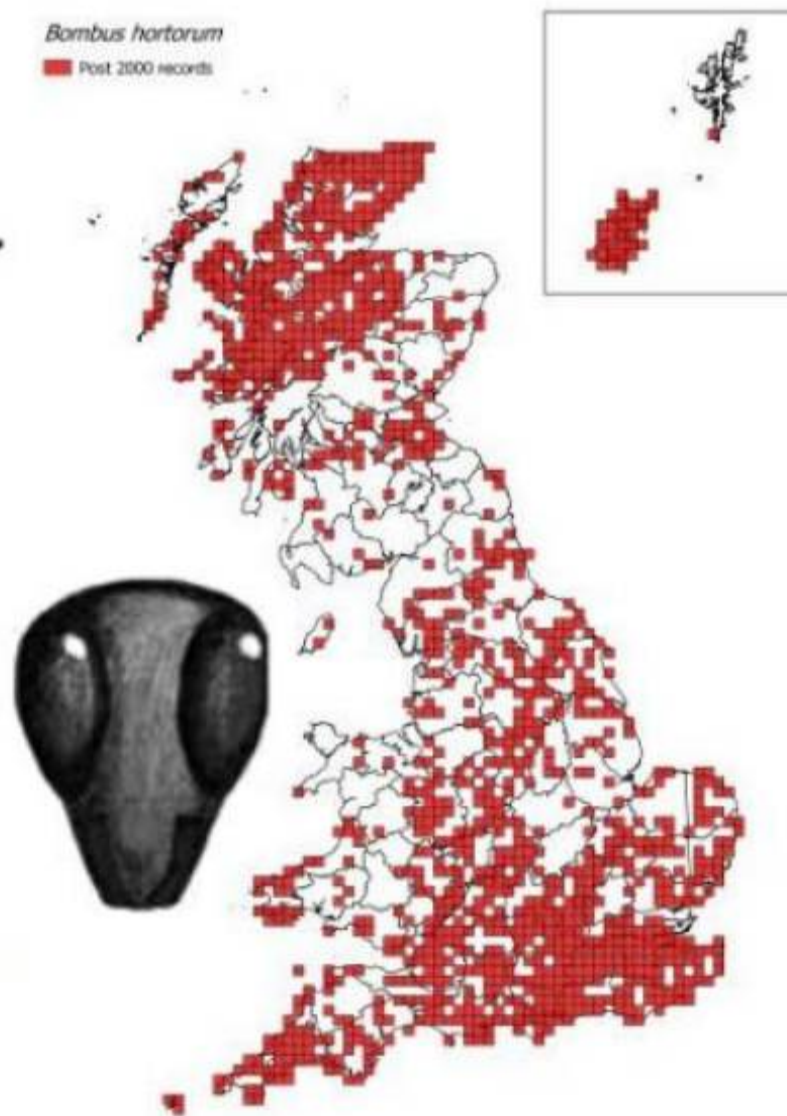


Worker



Male

Bombus hortorum
■ Post 2000 records





Queen



Worker



Male

Bombus lucorum
■ Post 2000 records





Queen



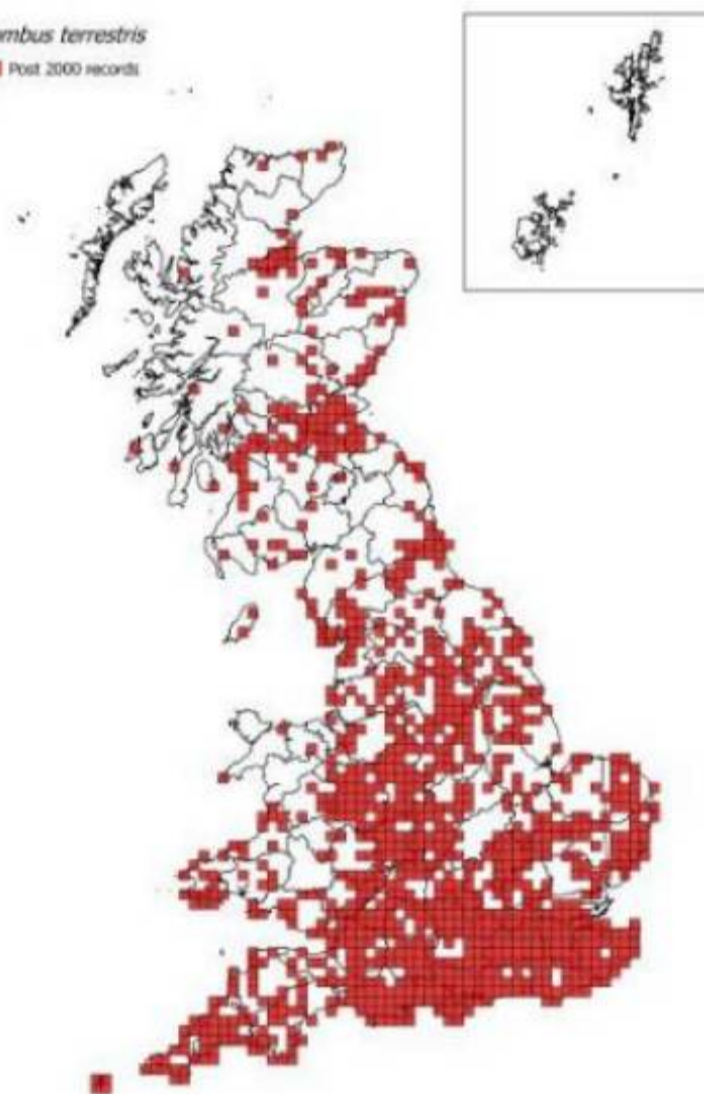
Worker



Male

Bombus terrestris

■ Post 2000 records





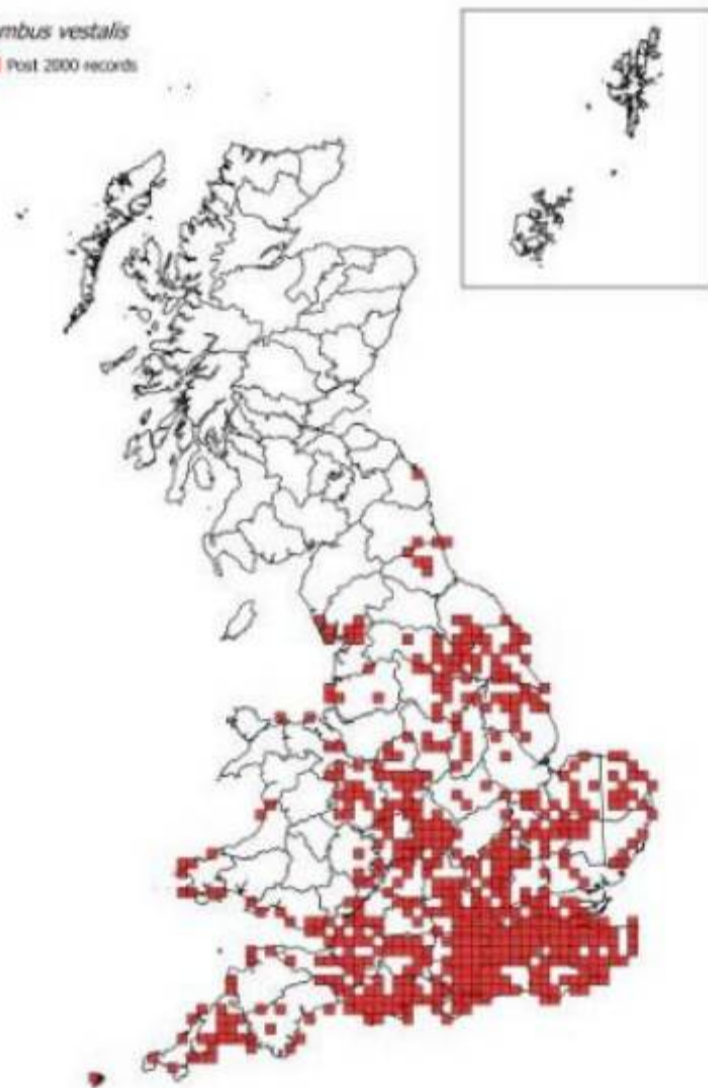
Female



Male

Bombus vestalis

Post 2000 records





Queen



worker



Male

Bombus lapidarius
■ Post 2000 records





Queen



Worker



Male

Bombus pascuorum

Post 2000 records

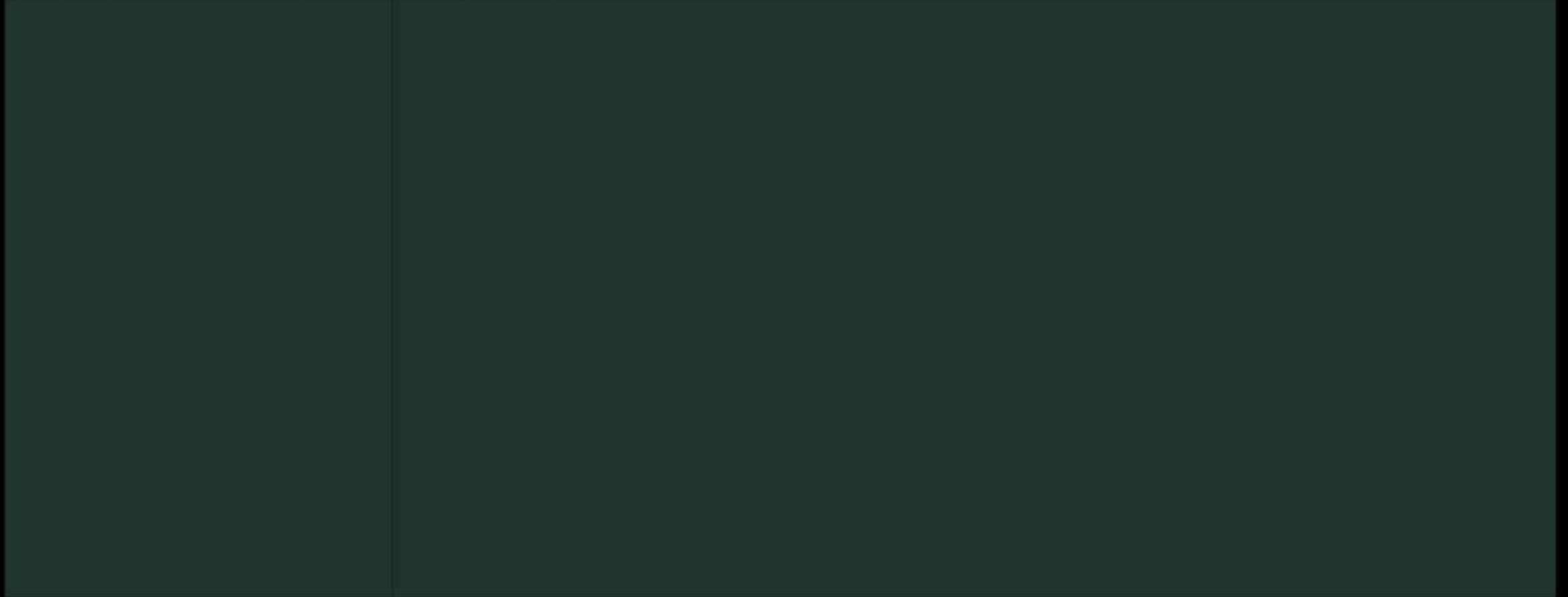


A close-up photograph of several yellow dandelions. The flowers are in various stages of bloom, with some showing their characteristic seed heads. The background is dark and out of focus, making the bright yellow flowers stand out. A white rectangular box with black text is overlaid on the right side of the image.

Please don't
pull or spray
the spring
DANDELIONS,
they are one
of the first
sources of
food for
BEEES

PLANTING FOR POLLINATORS ALL YEAR ROUND

Twenty reliable choices, season by season, for a southern England garden



Sources: RHS Plants for Pollinators; The Wildlife Trusts — Best plants for bees and pollinators (accessed 15 Sep 2026)

FOOD FOR POLLINATORS FROM SPRING TO AUTUMN

A reliable flower sequence for southern England



Sources: RHS Plants for Pollinators; The Wildlife Trusts — Best plants for bees and pollinators (accessed 15 Sep 2026)

20,000 species of bee

8 species of honey bee

43 sub species of honey bee

**Present on every continent except
Antarctica**

Eusocial superorganisms

Overlapping of generations

Cooperative brood care

Reproductive division of labour

Polyandry- queen mates with multiple males

Genetic diversity

THE WESTERN HONEY BEE

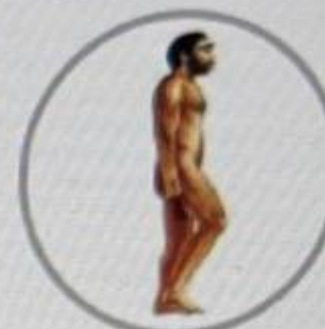
Apis mellifera mellifera



EASTERN HONEY BEE

Apis mellifera cerana





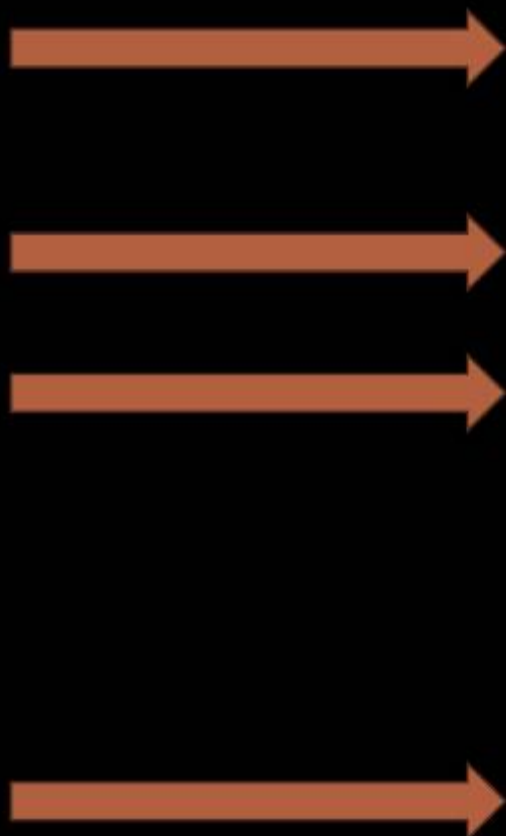
230
MYA
Dinosaurs
appeared

140
MYA
First flowers
evolved

130
MYA
First bees
evolved

60
MYA
Honey bees
evolved

2.8
MYA
Humans
evolved



era	time (millions of years ago)	important events
Cenozoic	0.0	present time
	less than 0.1	advent of modern humans
	2.4	ice age
Mesozoic	66.4	mass extinction
	141	first flowering plants
	195	birds evolve from reptiles
	230 245	first dinosaurs
Paleozoic	280	mass extinction
	340	reptiles appear
	360	first insects
	370	amphibians appear
	420	plants colonize land
Precambrian	540	
	700	simple multicellular organisms evolve
	2, 100	oldest eukaryotic fossils
	2, 500	oxygen begins to accumulate in atmosphere
	3, 500	oldest prokaryotic fossils

Fossil of primitive bee

Mesozoic period

100 MYA

Wasp-like

Carnivore



Fossil of honey bee

37 MYA Eocene epoch

Palynivore



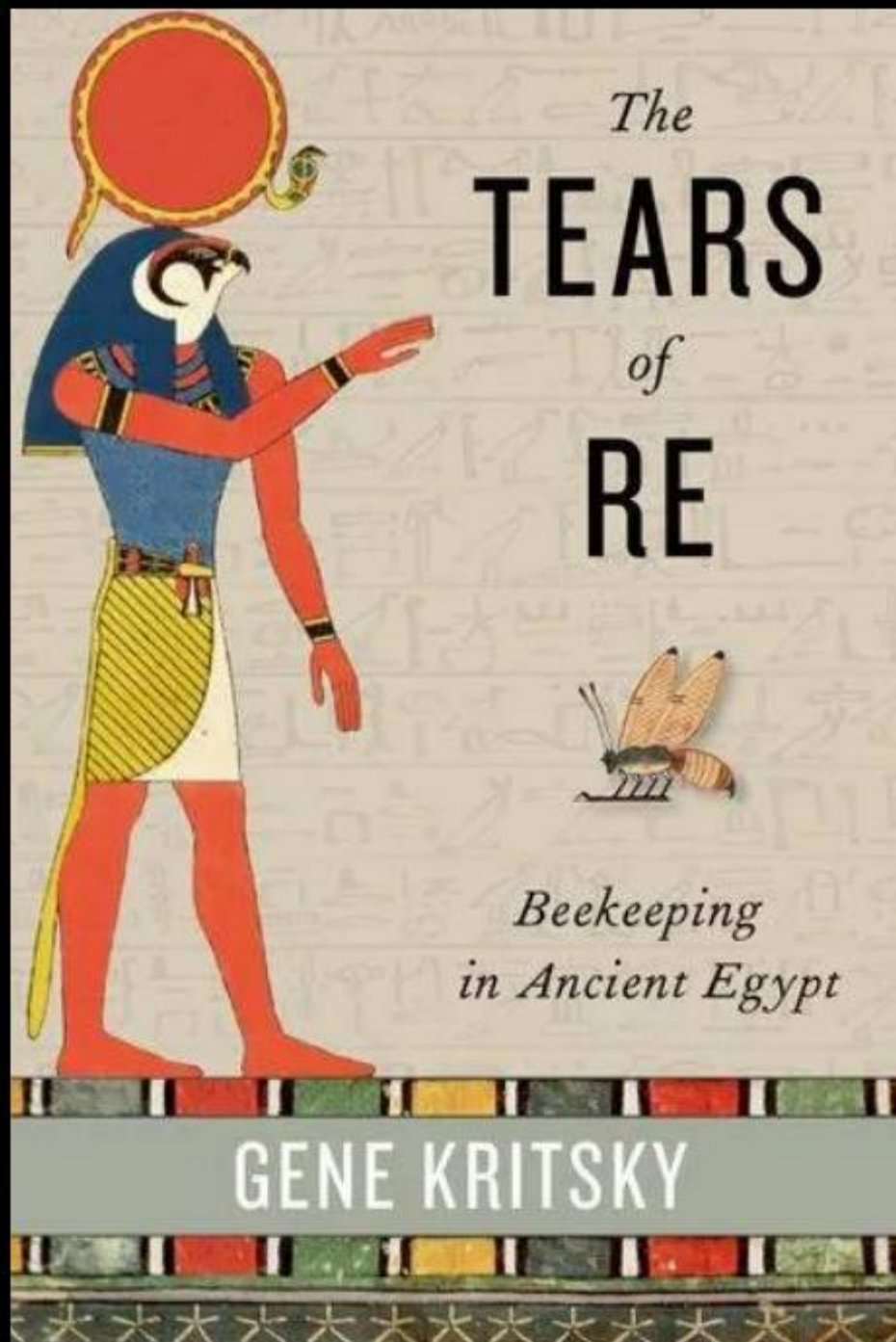


Coin of Ephesus with a bee

picture courtesy cgb.fr via Wikimedia Commons

26th Dynasty hieroglyphs depicting beekeepers







LORENZO LANGSTROTH

1851



ROOF

CROWN BOARD

SUPER

QUEEN EXCLUDER

BROOD BOX

FLOOR

STAND



EUROPEAN DARK HONEY BEE



**Italian honey
bee**



**Carniolan
Honey bee**





Bro Adam
Buckfast Abbey

The first Bee Bro'

Buckfast bee





- Honey bees have 2 sexes
- And 2 'castes'
- Males - drones
- Females:
 - Queen – egg-laying machine
 - Workers - sterile

- **QUEEN**

- **HEAD OF COLONY**

- **LAYS 1500-2000
EGGS A DAY**

- **MATES WITH 15-20
DRONES
(POLYANDRY)**

- **LIVES 3-5 YEARS
BUT....**





DRONE

Mates with virgin queens

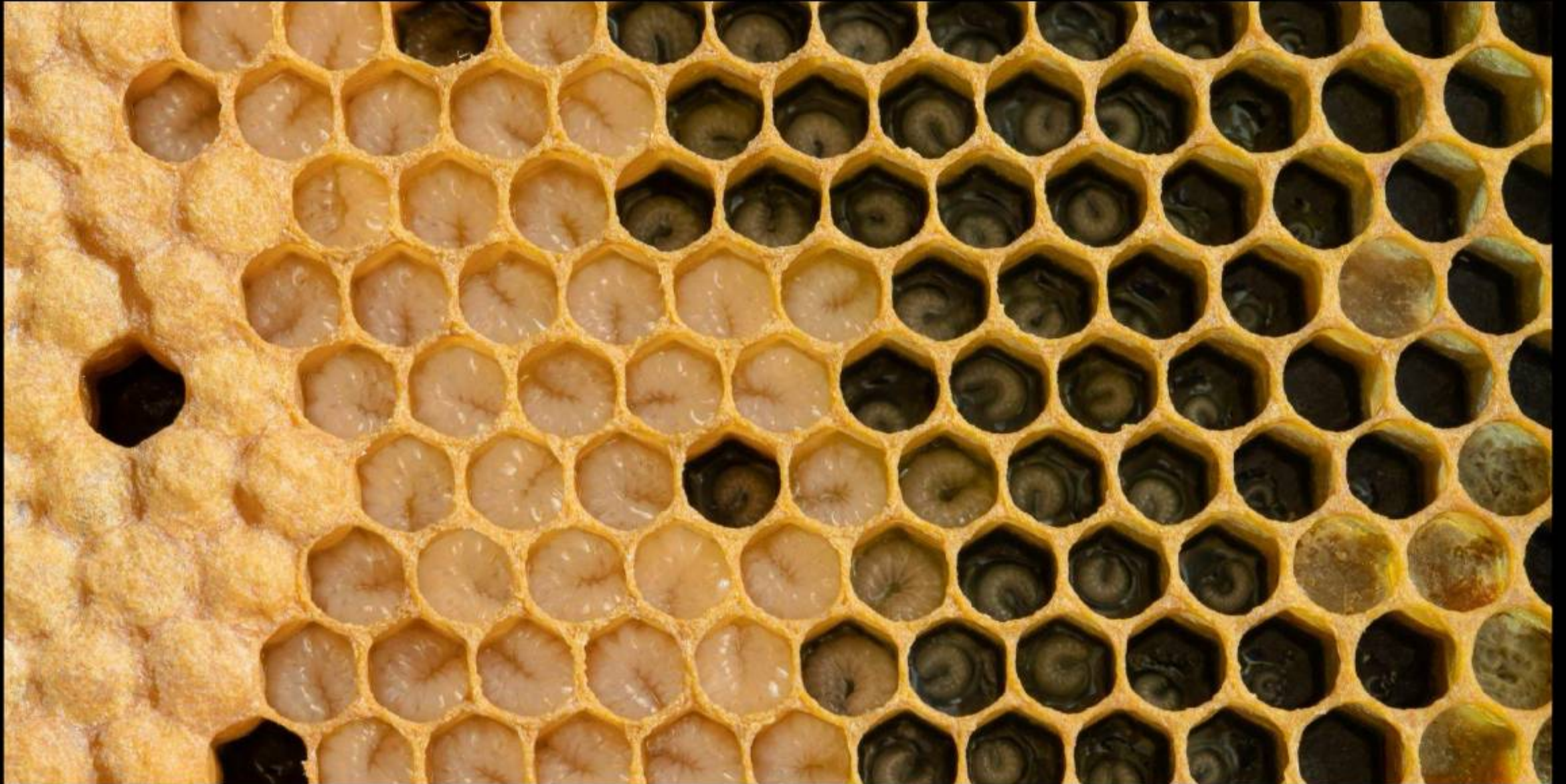
And then dies

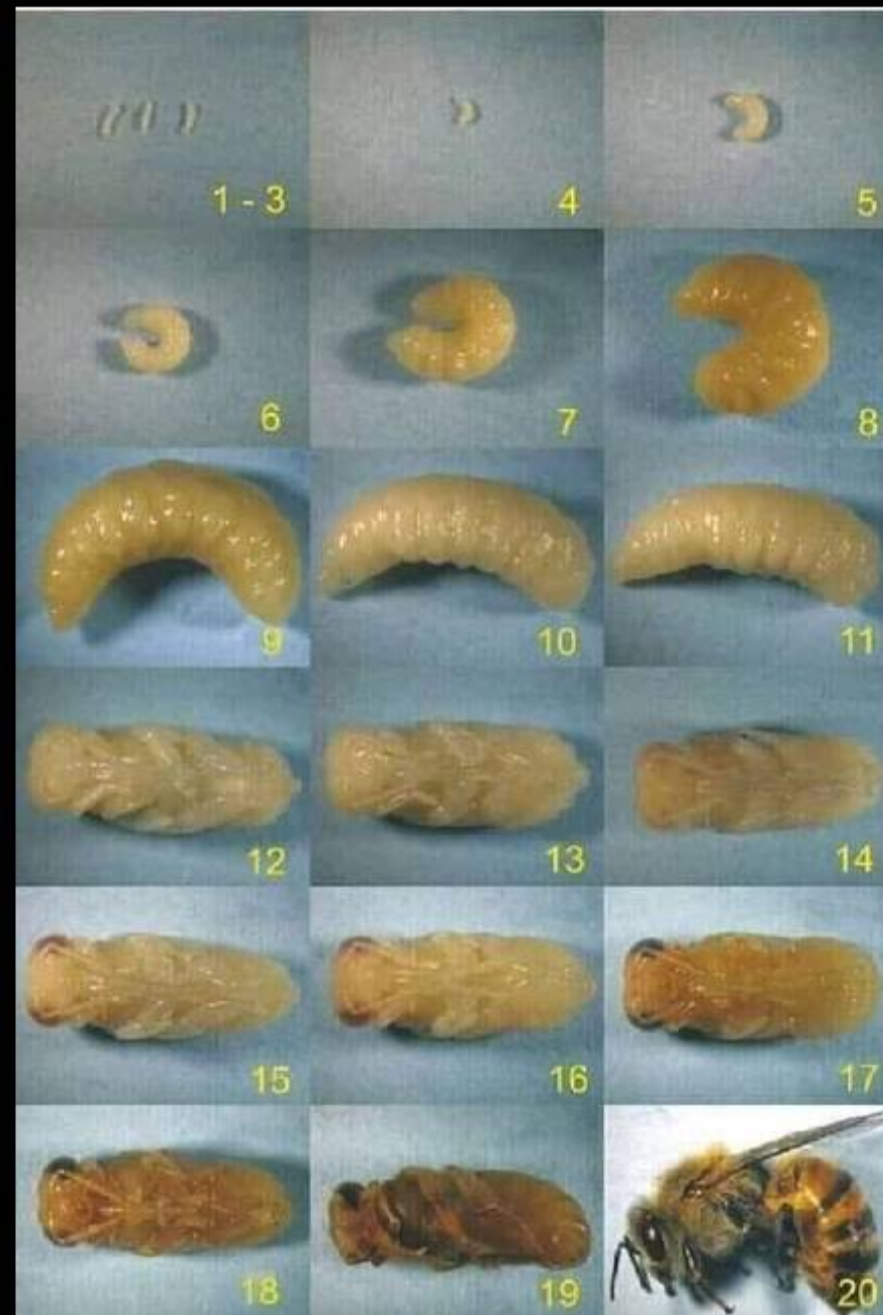


WORKER









EGG TO DRONE
EMERGENCE 24
DAYS



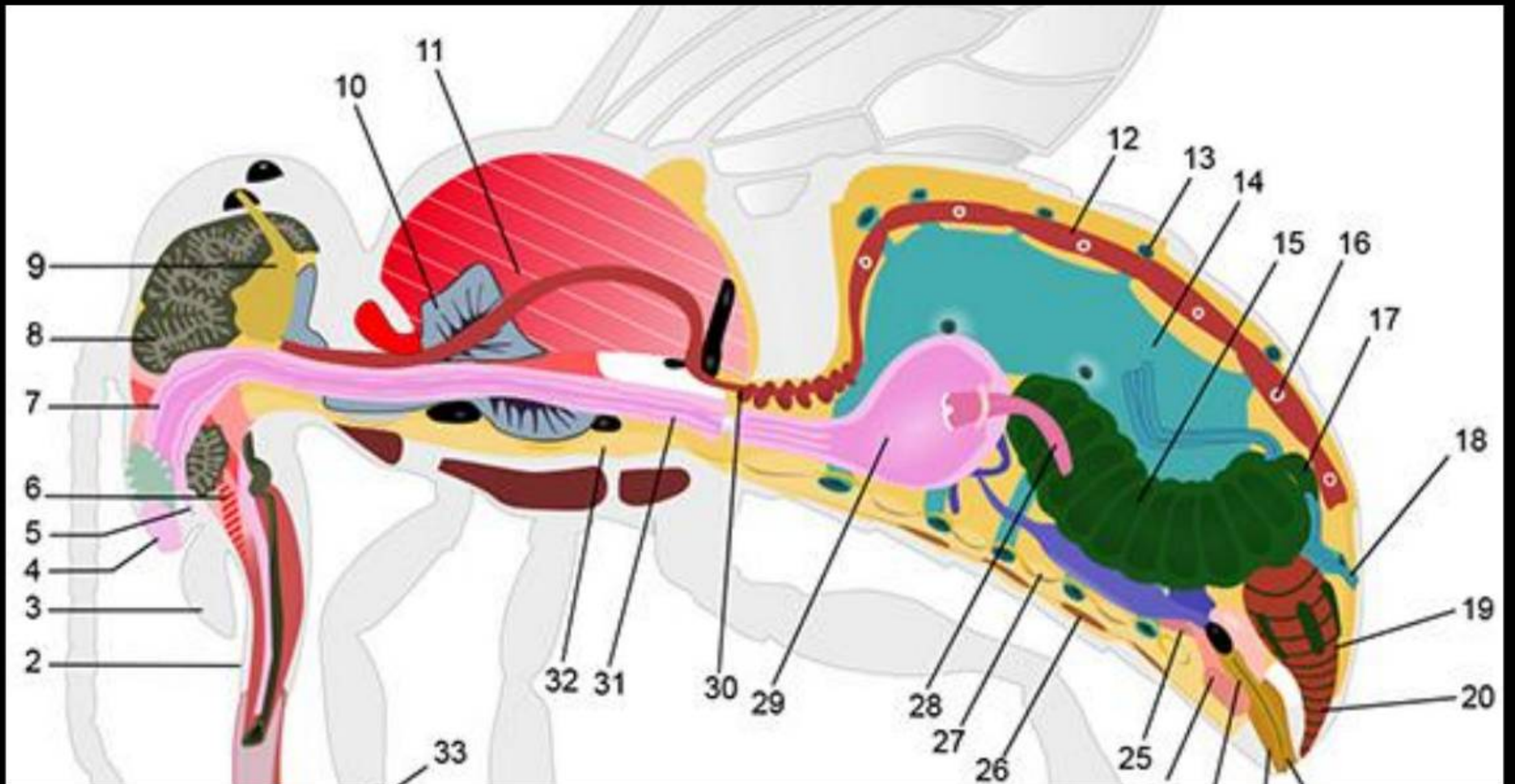
**EGG TO FULLY
DEVELOPED
WORKER 21 DAYS**

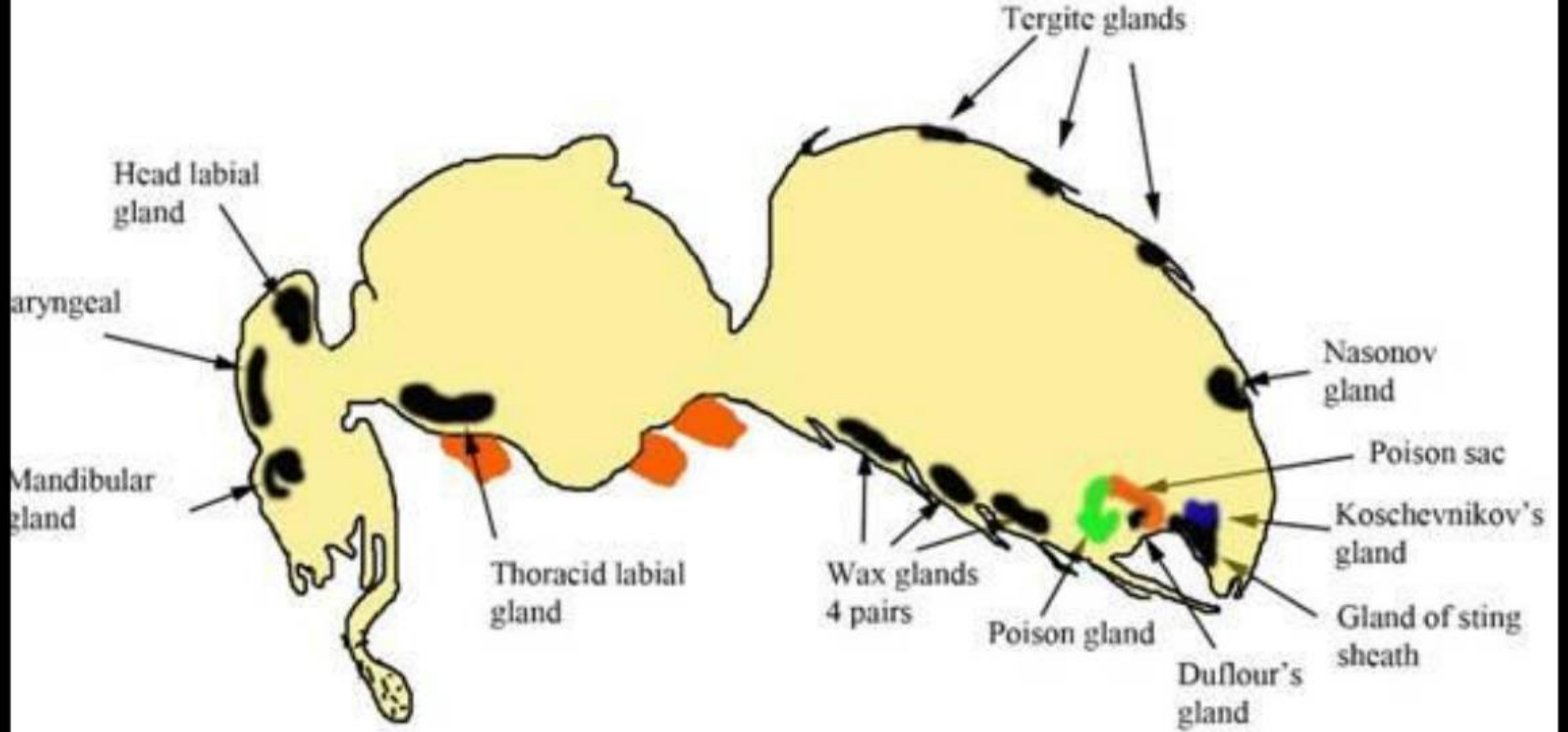




**EGG TO FULLY
DEVELOPED QUEEN IN 16
DAYS**







WORKER

FIRST THREE DAYS

3-6 DAYS

6-9 DAYS

9-18 DAYS

18-21 DAYS

21-42 DAYS



POLYETHISM: MULTI -TASKING



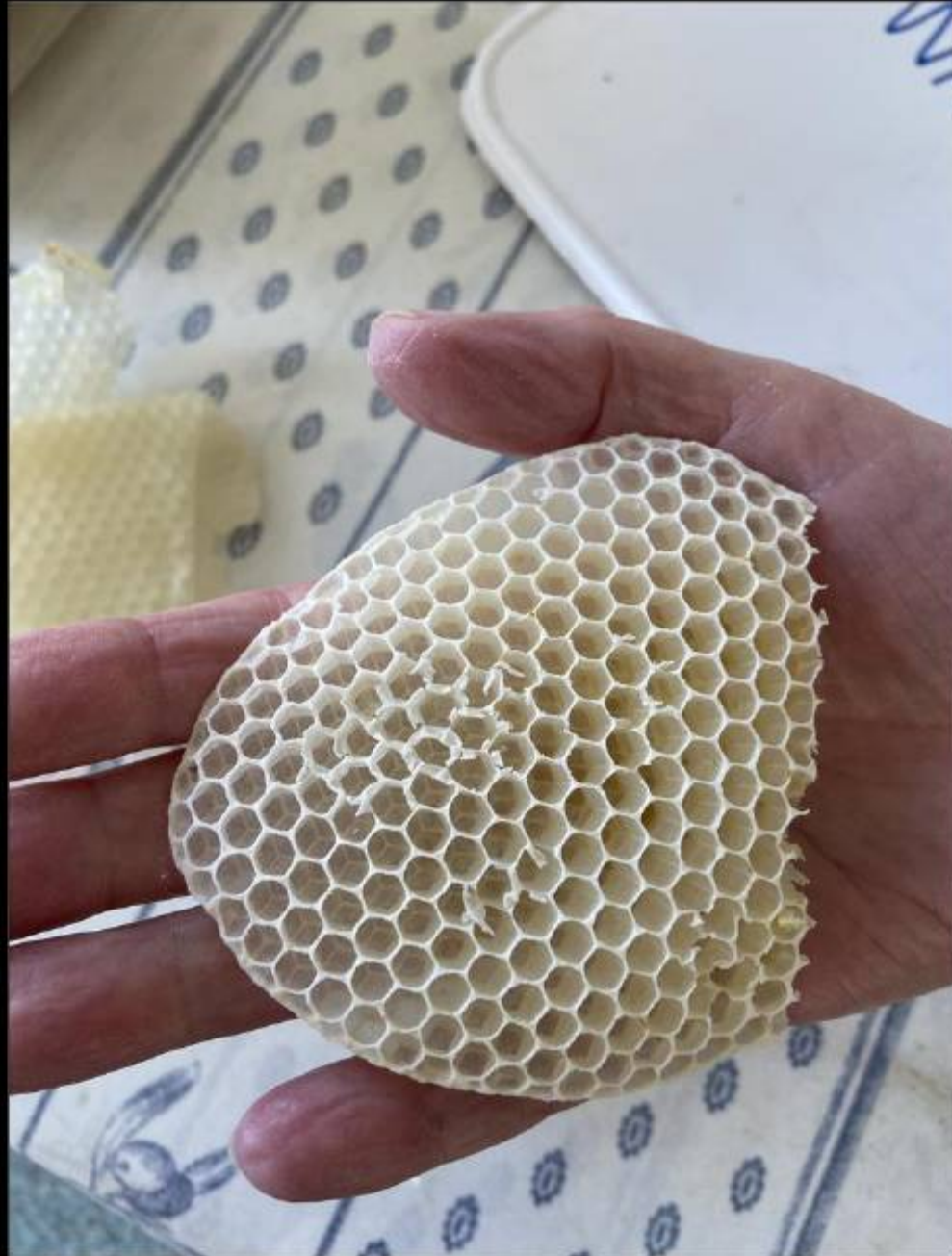
YOUNG WORKER FEEDING LARVAE



QUEEN WITH RETINUE



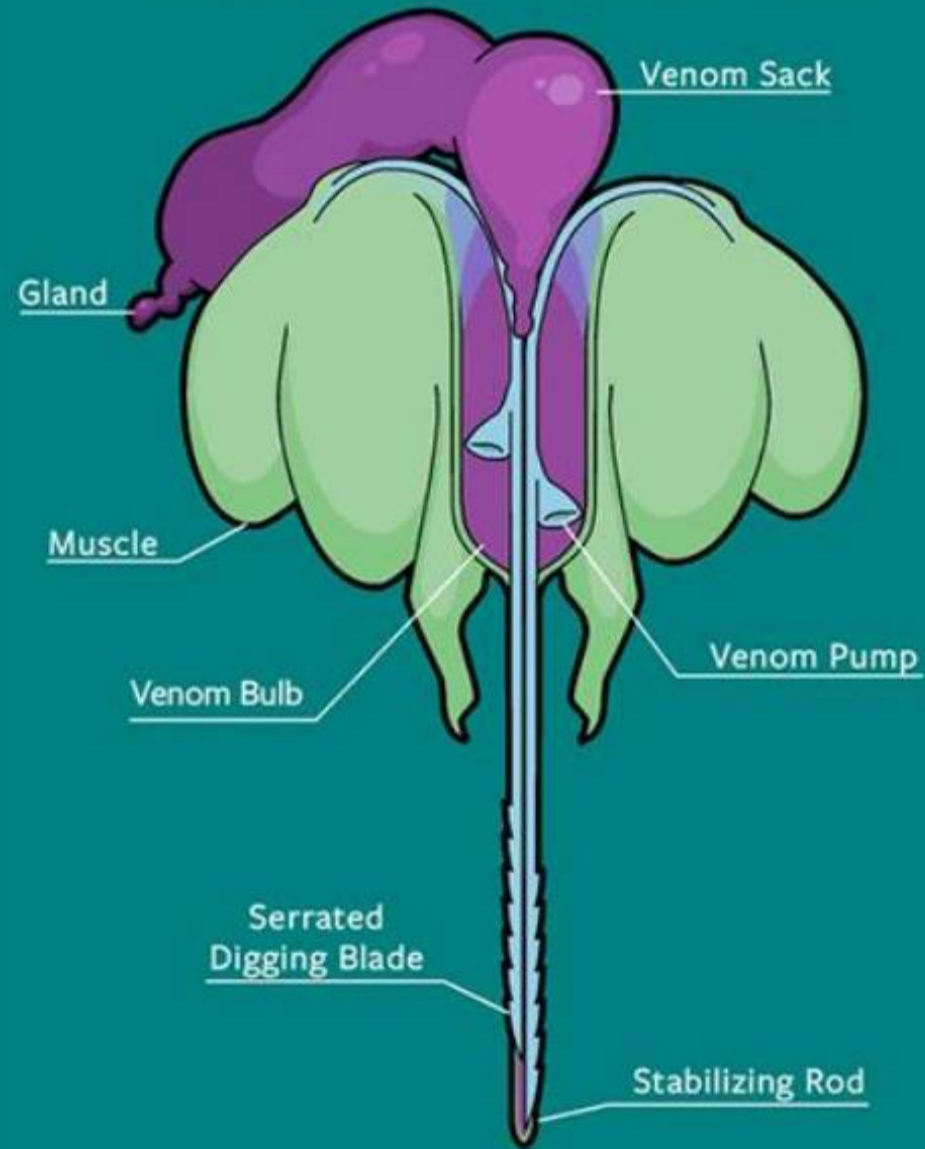
COMB BUILDING



En garde!



HONEY BEE STINGER







■ **WHAT DO THEY EAT?**

■ **NECTAR –
CARBOHYDRATE**

■ **POLLEN – PROTEIN**

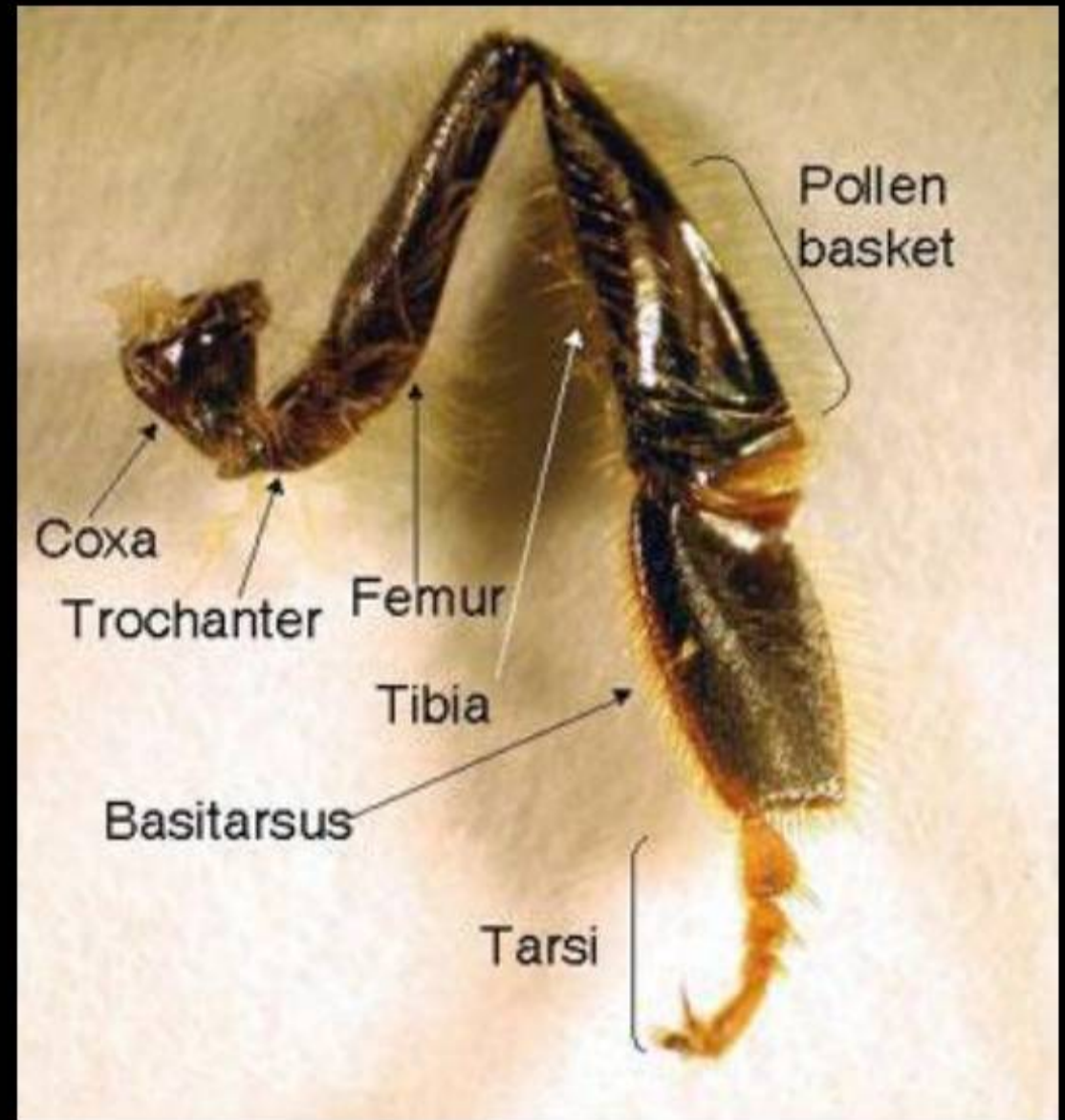
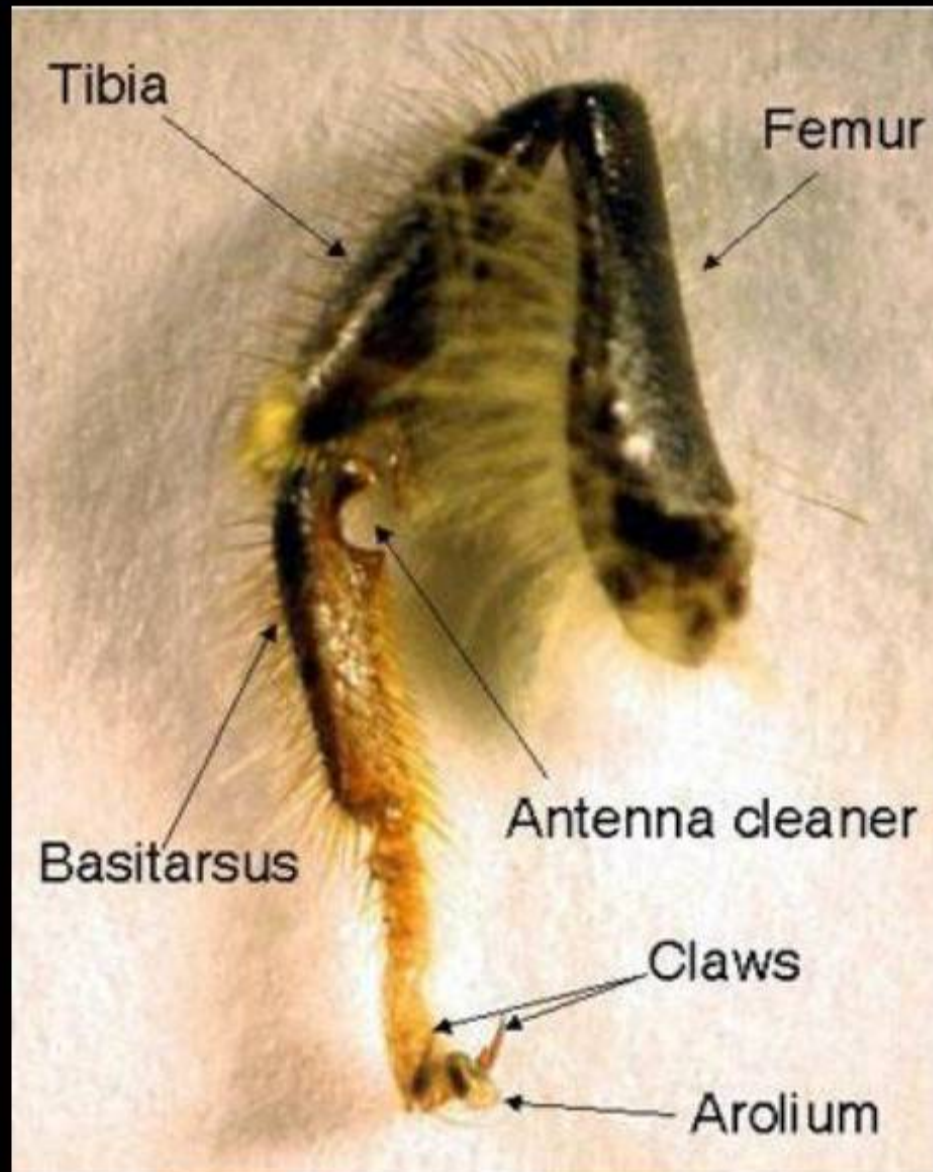


HONEY BEE COLLECTING NECTAR



TROPHYLLAXIS – FOOD SHARING











- NECTAR 80% WATER

- ADD ENZYMES

- SUCRASE

- DIASTASE

- GLUCOSE OXIDASE

- FRUCTOSE & DEXTROSE

- EVAPORATE TO 17%

- HONEY

- COVER WITH WAX



FRAME OF CAPPED HONEY



REAL HONEY
ISN'T CHEAP
AND
CHEAP HONEY
ISN'T REAL

- **ANNUAL CYCLE**
- **SPRING BUILD-UP**
- **SWARM**
- **SUMMER FORAGING**
- **AUTUMN**
- **WINTER CLUSTER**







SWARMS

COLONY REPRODUCTION

BIVOUAC

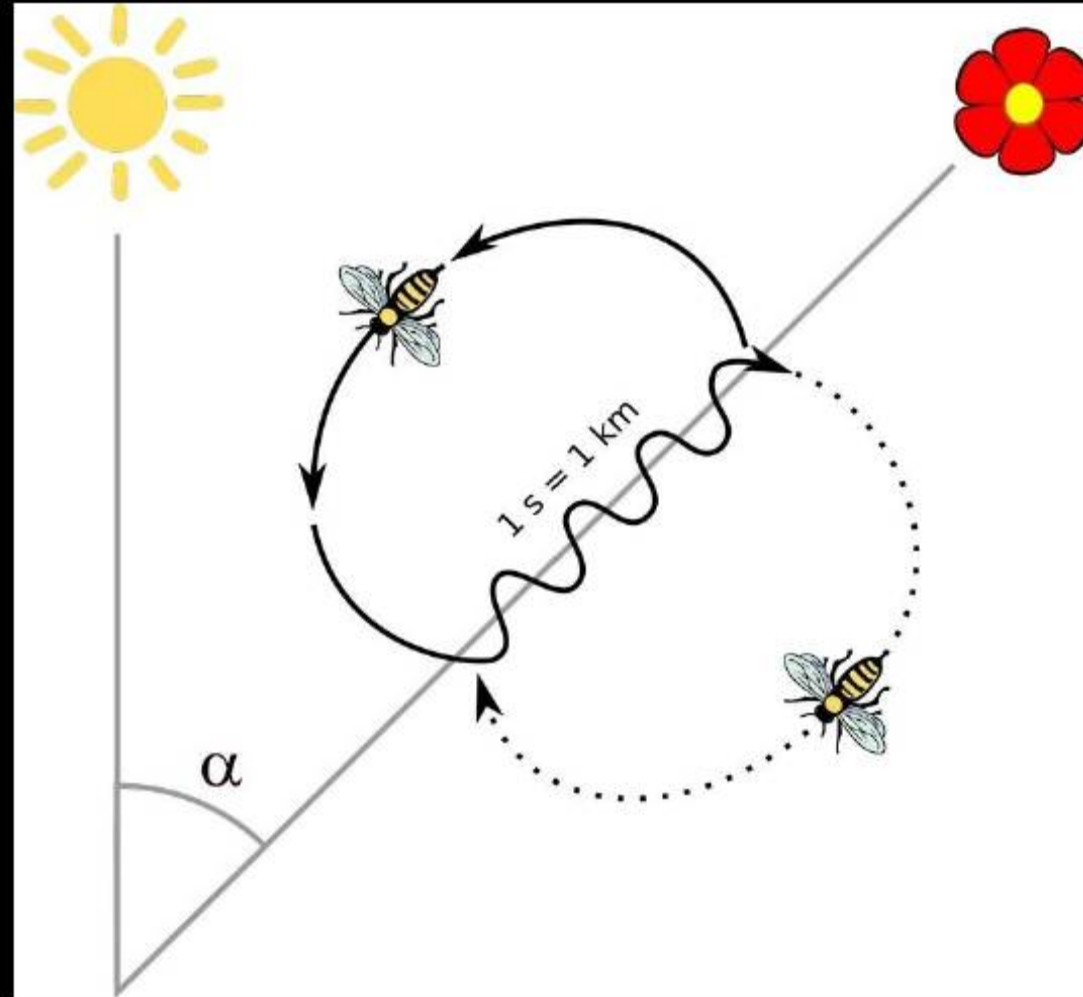
NEW HOME

COMMUNICATION



COMMUNICATION

WAGGLE DANCE







THE ASIAN HORNET

Vespa velutina nigrathorax









Fareham & District Beekeepers' Association





Bumblebee
Conservation
Trust





THANK YOU FOR LISTENING

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