Honey bee anatomy

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The head
Center of information (can you name at least 3 types?)
gathering & processing
Optical input
How many eyes does a bee have?

Ocelli function?

Food input
Most insects have:
   either chewing: grasshoppers,
Or sucking mouthparts:
   But bees have both!

Mandible
Maxilla
Labial palpus
Glossa
Labellum
Hamuli (wing hooks)
Stinger with venom

![Image of a stinger with venom](image1)

![Image of a stinger](image2)
Inside the head:
hypopharyngeal glands:
produces protein for royal jelly in nurses,
but invertase in foragers

Individual “acini” of glands
Regression of hypopharyngeal gland

After removal of glands and trachea:
An annotated bee brain

Corpora allata: the only organ that produces juvenile hormone (caste differentiation, molting, division of labor)
Mandibular glands
Also changes function with age:
Young bees: lipids for royal jelly
Old bees: alarm pheromone (2-haptanone)
What is the other one?  Isopentyl acetate

Thorax: flying, walking, pollen collection !(branched hairs)
Flight muscles

How do bees fly?
Compressible box with fulcrum

How do bees get warmth during winter
(remember, you do not want to move your wings!)

http://wpcontent.answers.com/wikipedia/commons/c/c2/Motion_of_Insectwing.gif
Abdomen
(digestion, defense and wax production)
Wax glands

Are honey “bee vomits”?
Ovarioles of Queen

Summary

- Antenna can hear, smell and taste
- Bees do have brains! (1 million neuron)
- Two glands change functions with age
- Thorax is almost all muscles
- Pollen basket is really a dent with hairs around
- Hind wings hitch-hike on the front ones
- Honey is not “bee vomit”!
Huang’s websites

- http://cyberbee.net/gallery
- http://www.beetography.com

- Anatomy of honey bee by Huang:

- Email: bees@msu.edu