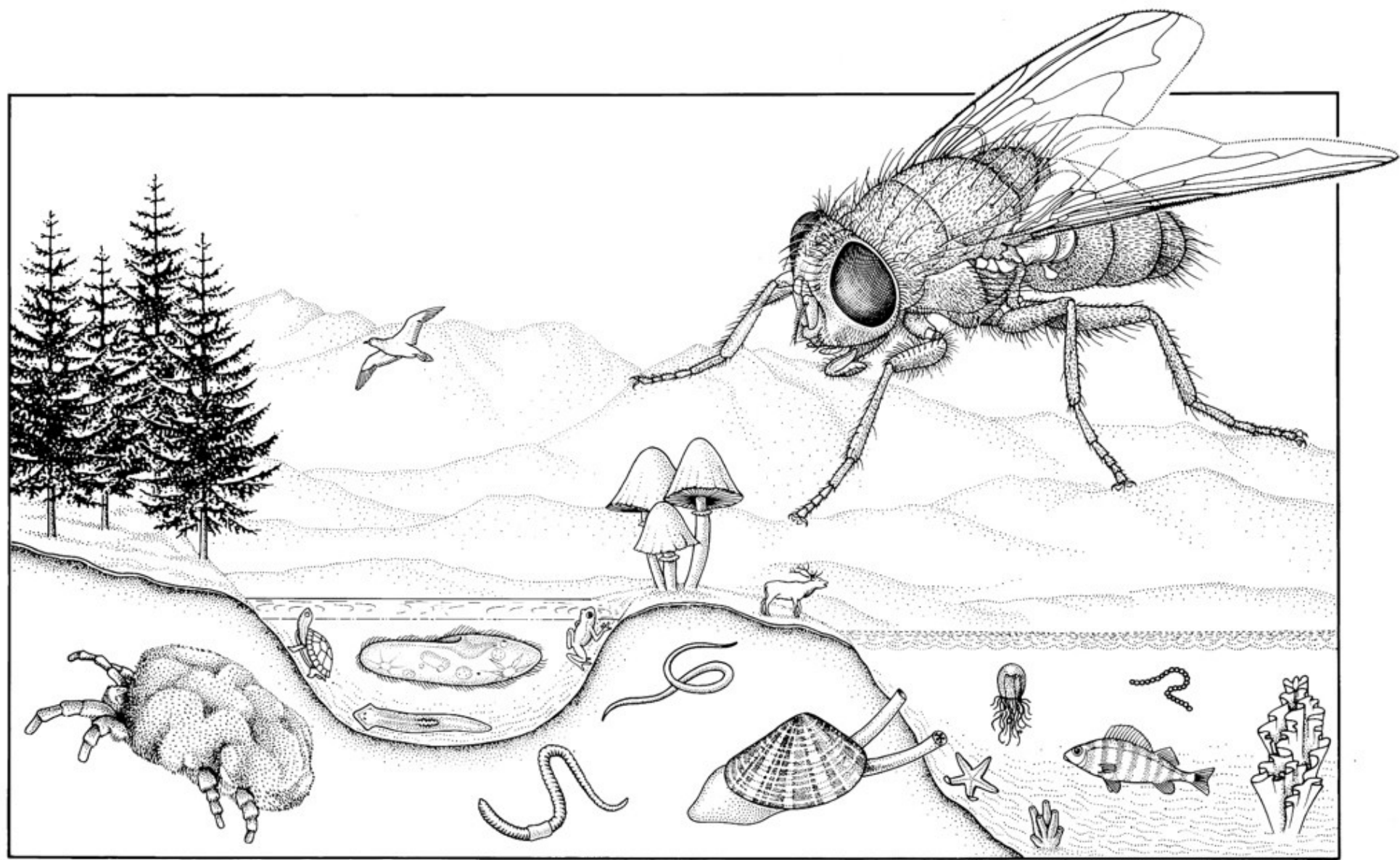


Insects



Gullan and Cranston The Insects

Brian O'Meara
EEB464 Fall 2015

Which of these could
survive best in hot water?

A. Strepsiptera

B. Anolis

C. T. aquaticus

D. Charles Darwin

E. Bonobo

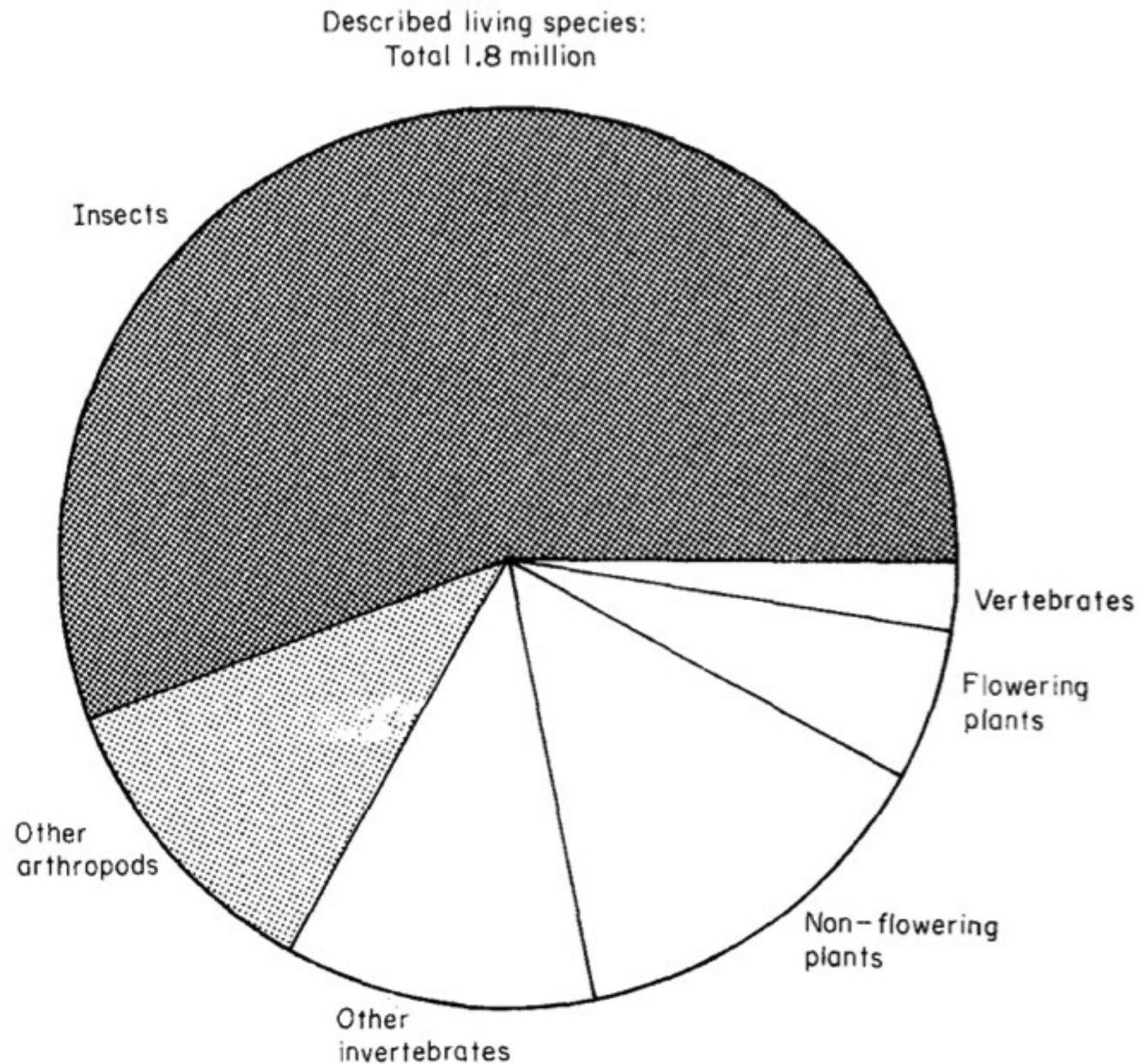
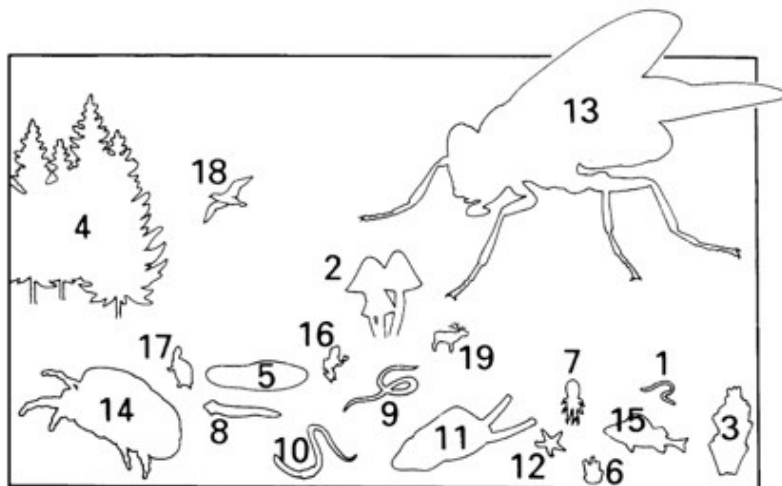
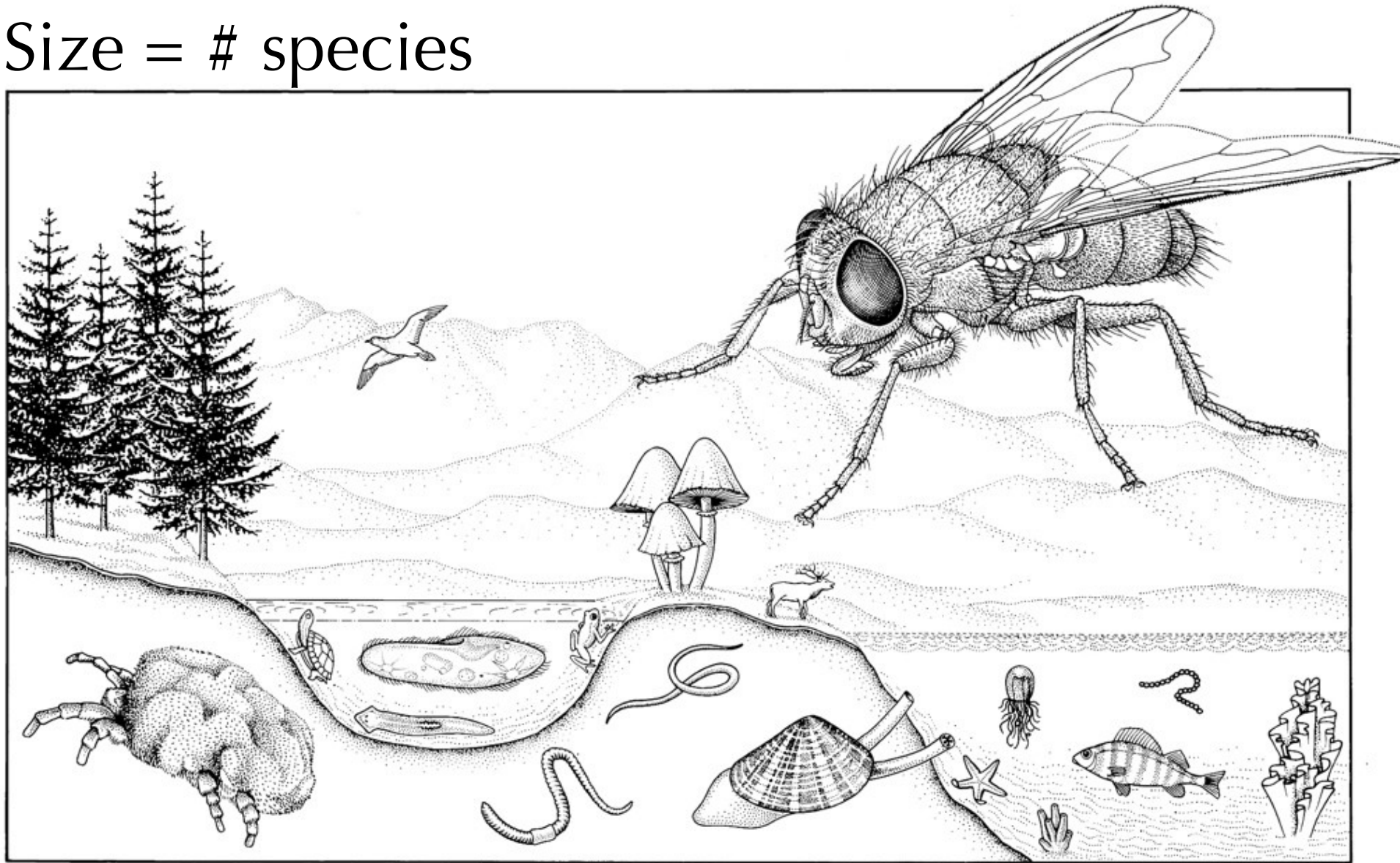


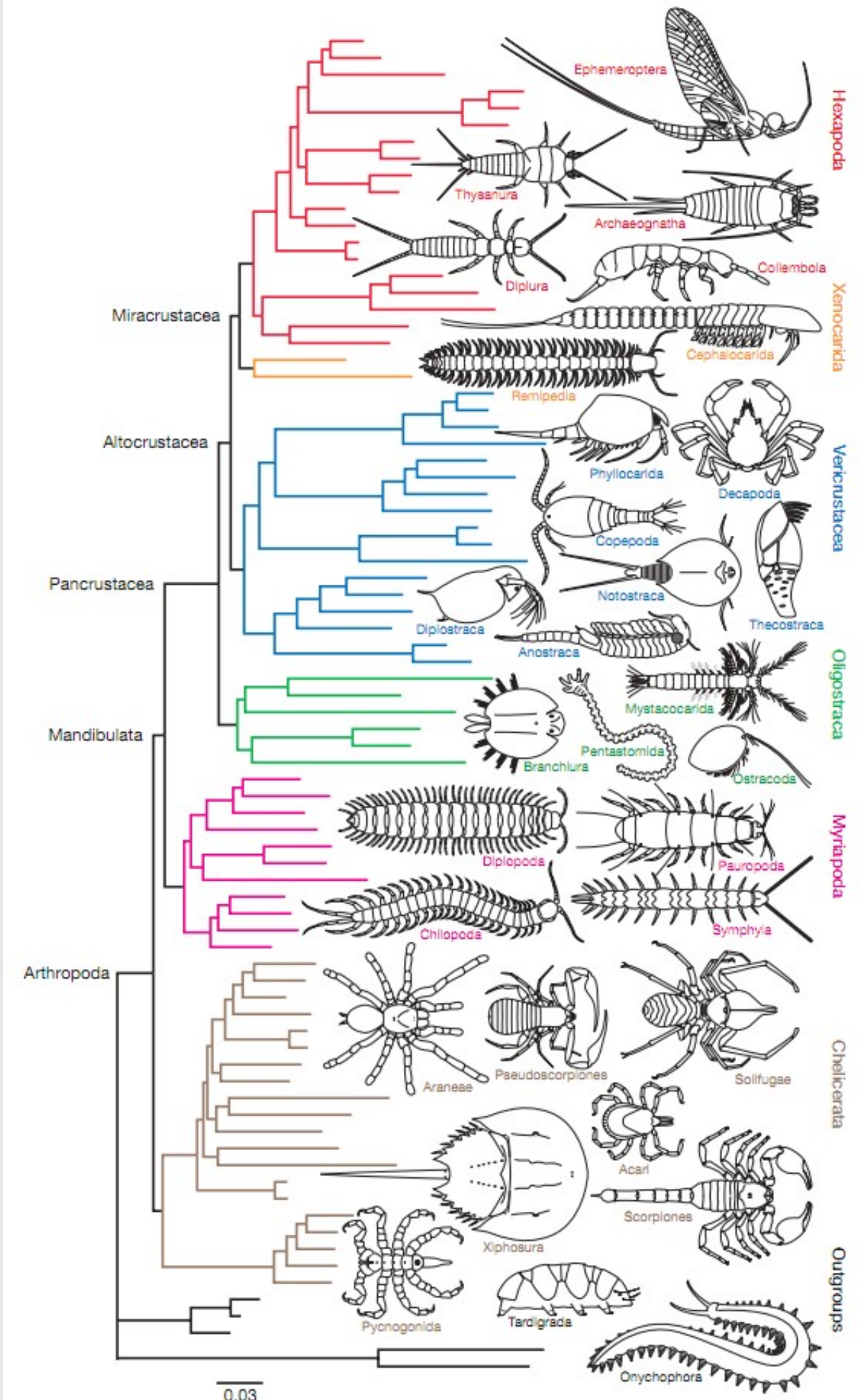
Figure 1. A pie-chart representing all of the 1.82 million described species of animals and plants divided into the major groups (data supplied by Dr N. M. Collins, Conservation Monitoring Centre, IUCN).

Size = # species



- 1 Prokaryotes
- 2 Fungi
- 3 Algae
- 4 Plantae (multicellular plants)

- 5 Protozoa
- 6 Porifera (sponges)
- 7 Cnidaria (jellyfish, corals, etc.)
- 8 Platyhelminthes (flatworms)
- 9 Nematoda (roundworms)
- 10 Annelida (earthworms, leeches, etc.)
- 11 Mollusca (snails, bivalves, octopus, etc.)
- 12 Echinodermata (starfish, sea urchins, etc.)
- 13 Insecta
- 14 Non-insect Arthropoda
- 15 Pisces (fish)
- 16 Amphibia (frogs, salamanders, etc.)
- 17 Reptilia (snakes, lizards, turtles)
- 18 Aves (birds)
- 19 Mammalia (mammals)

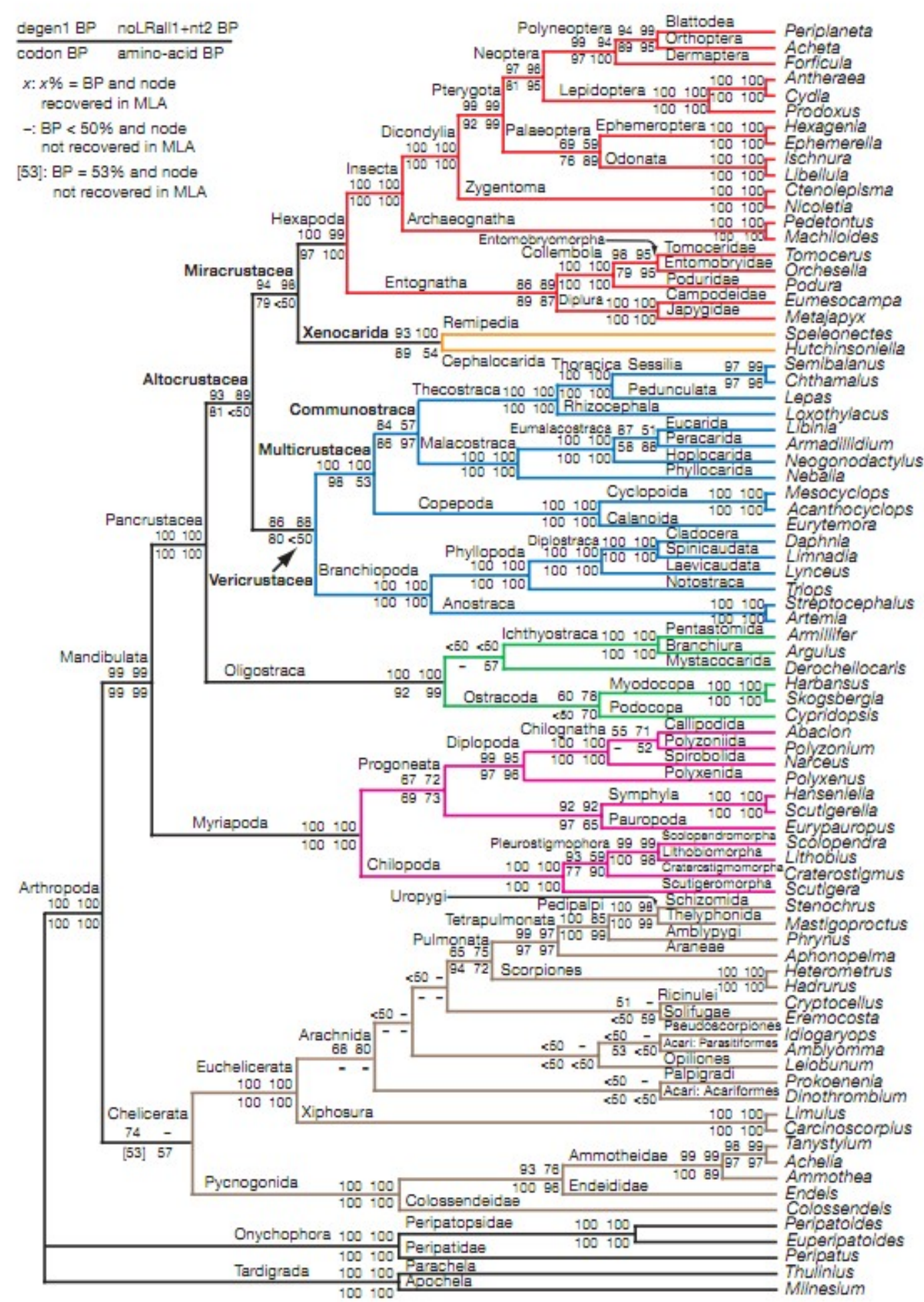


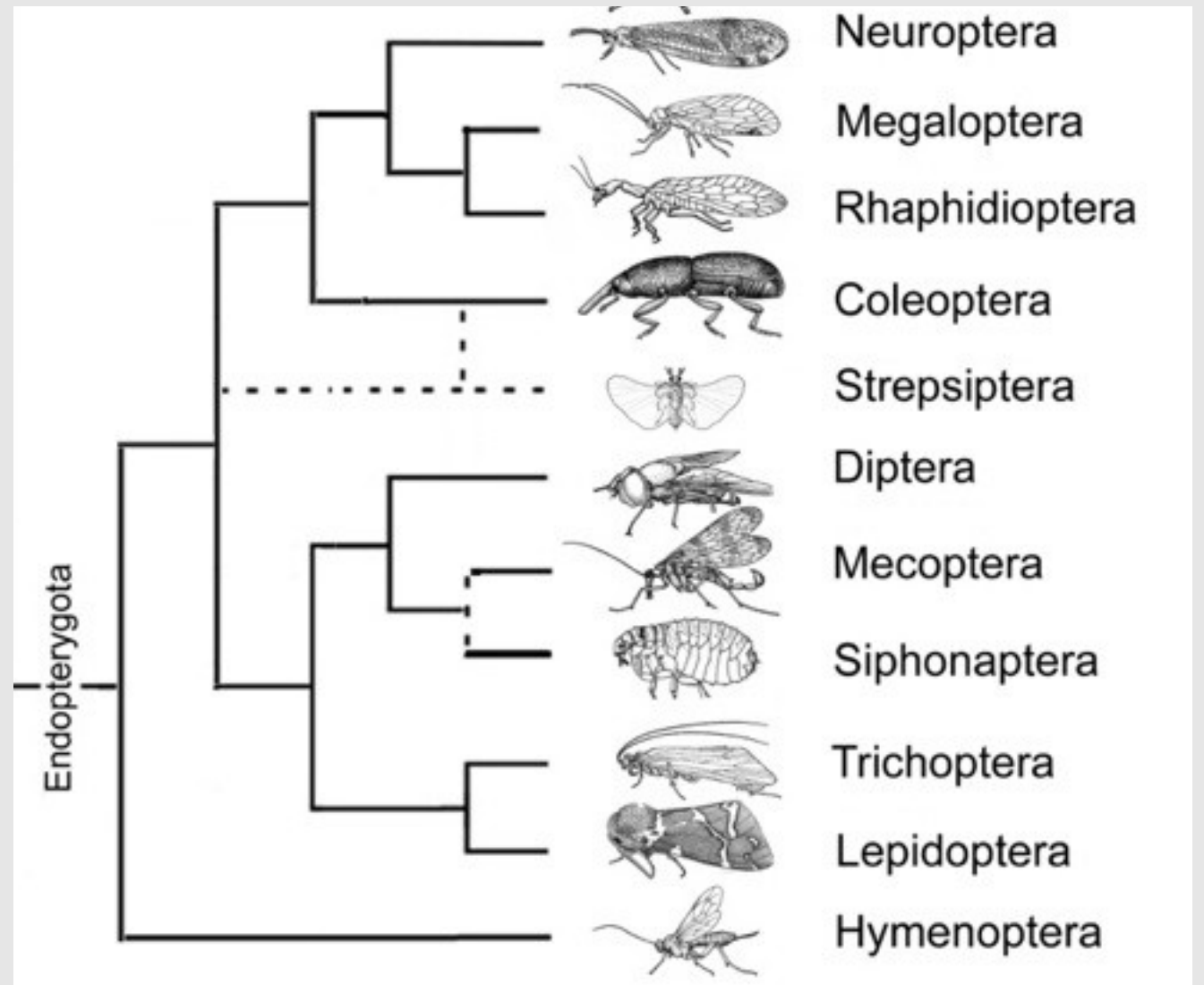
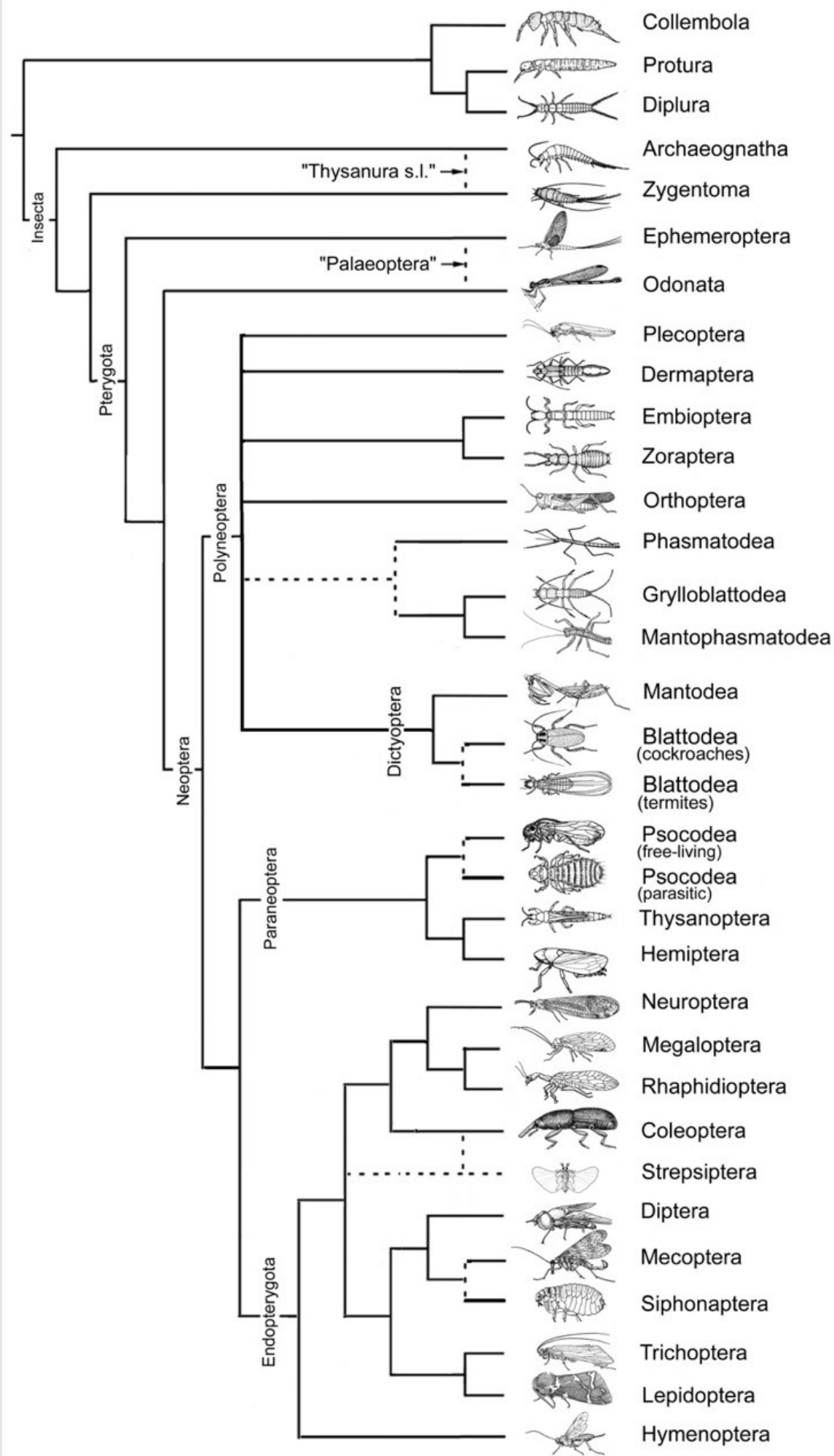
degen1 BP noLRall1+nt2 BP
 codon BP amino-acid BP

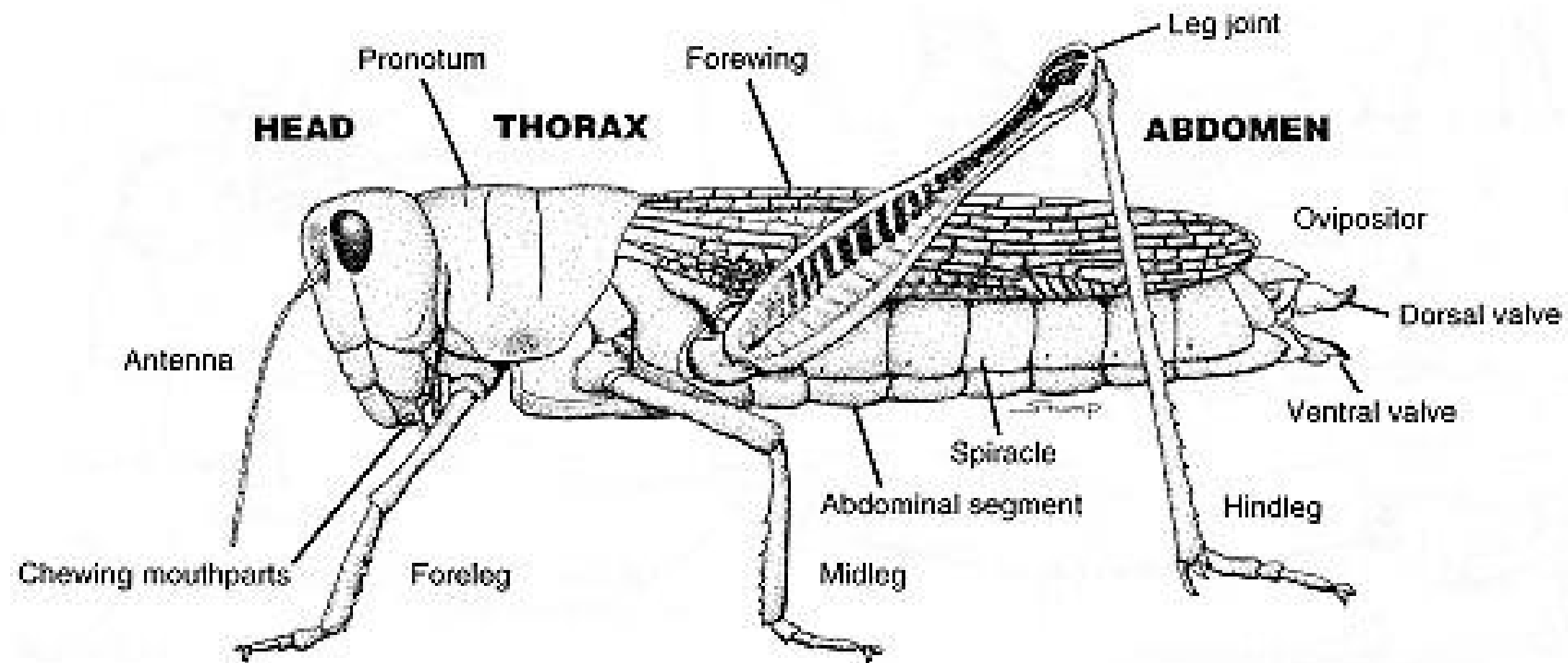
x: x% = BP and node
 recovered in MLA

-: BP < 50% and node
 not recovered in MLA

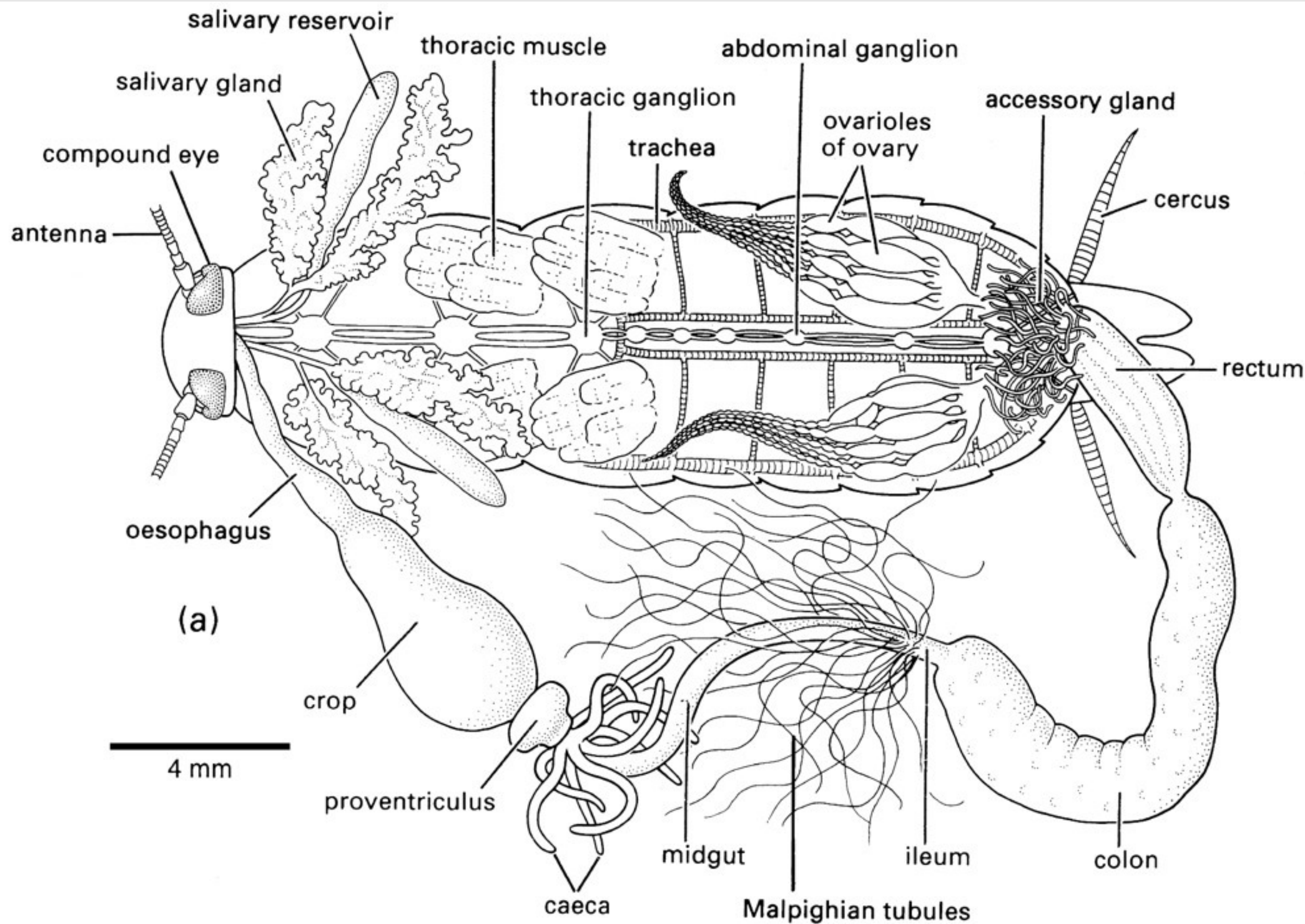
[53]: BP = 53% and node
 not recovered in MLA

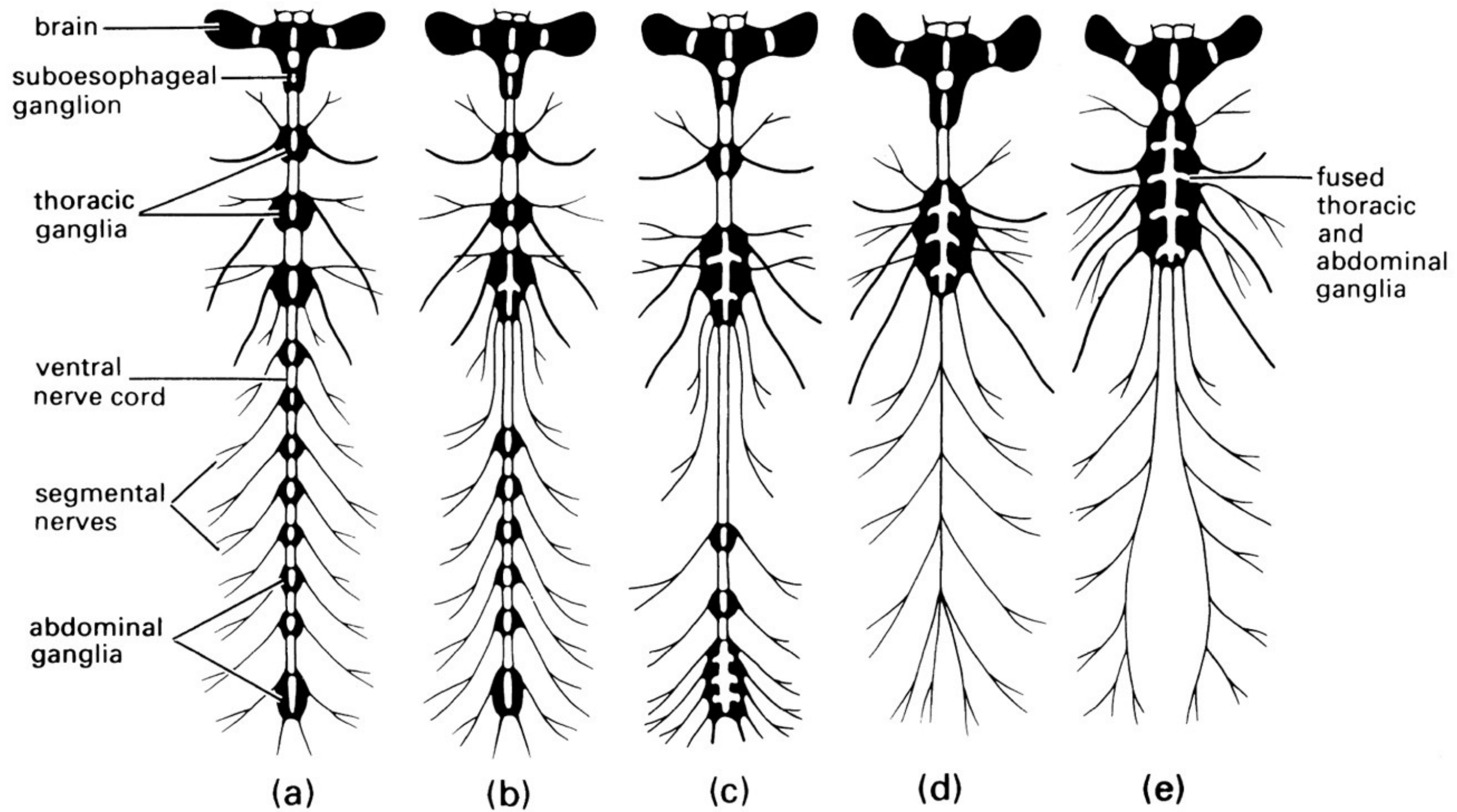


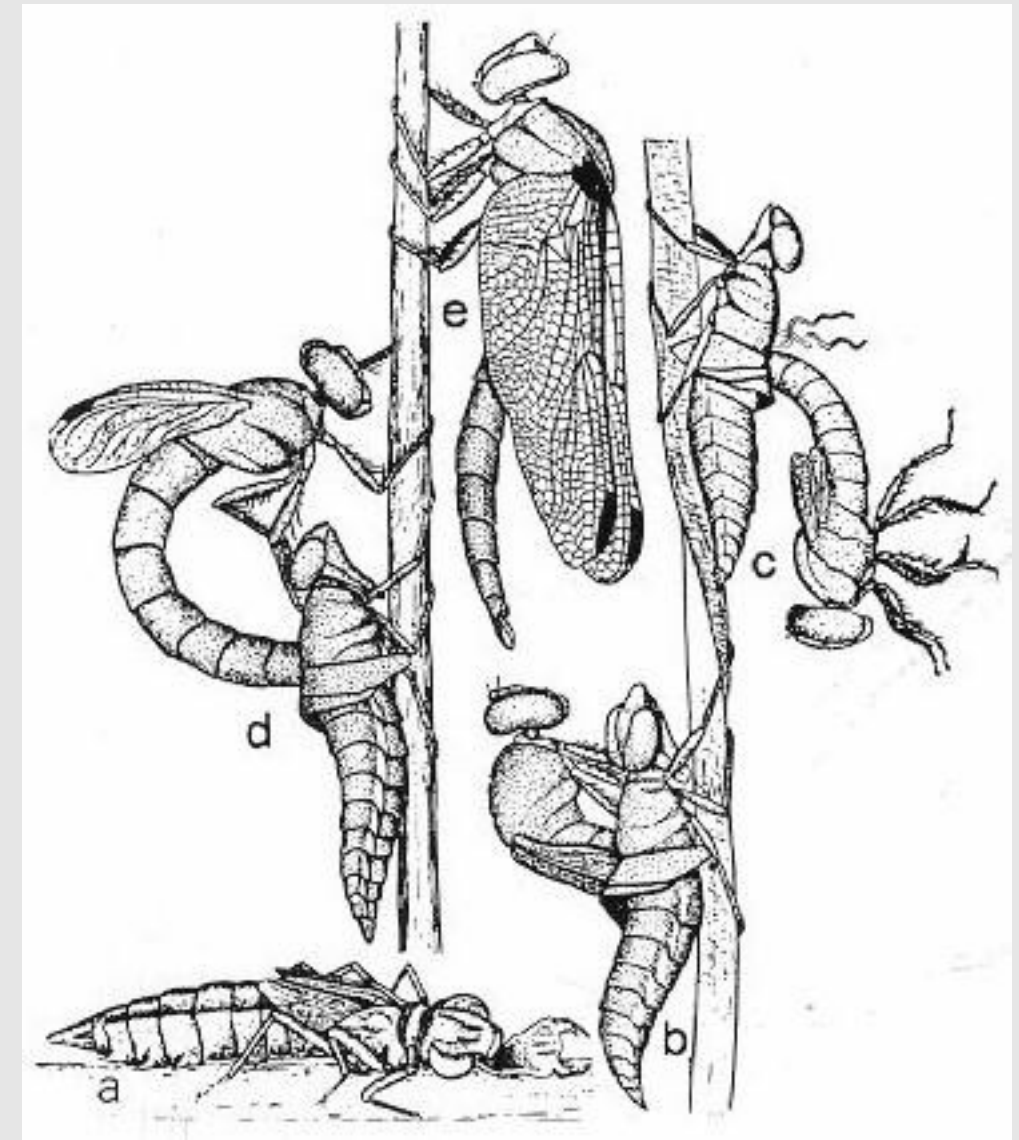
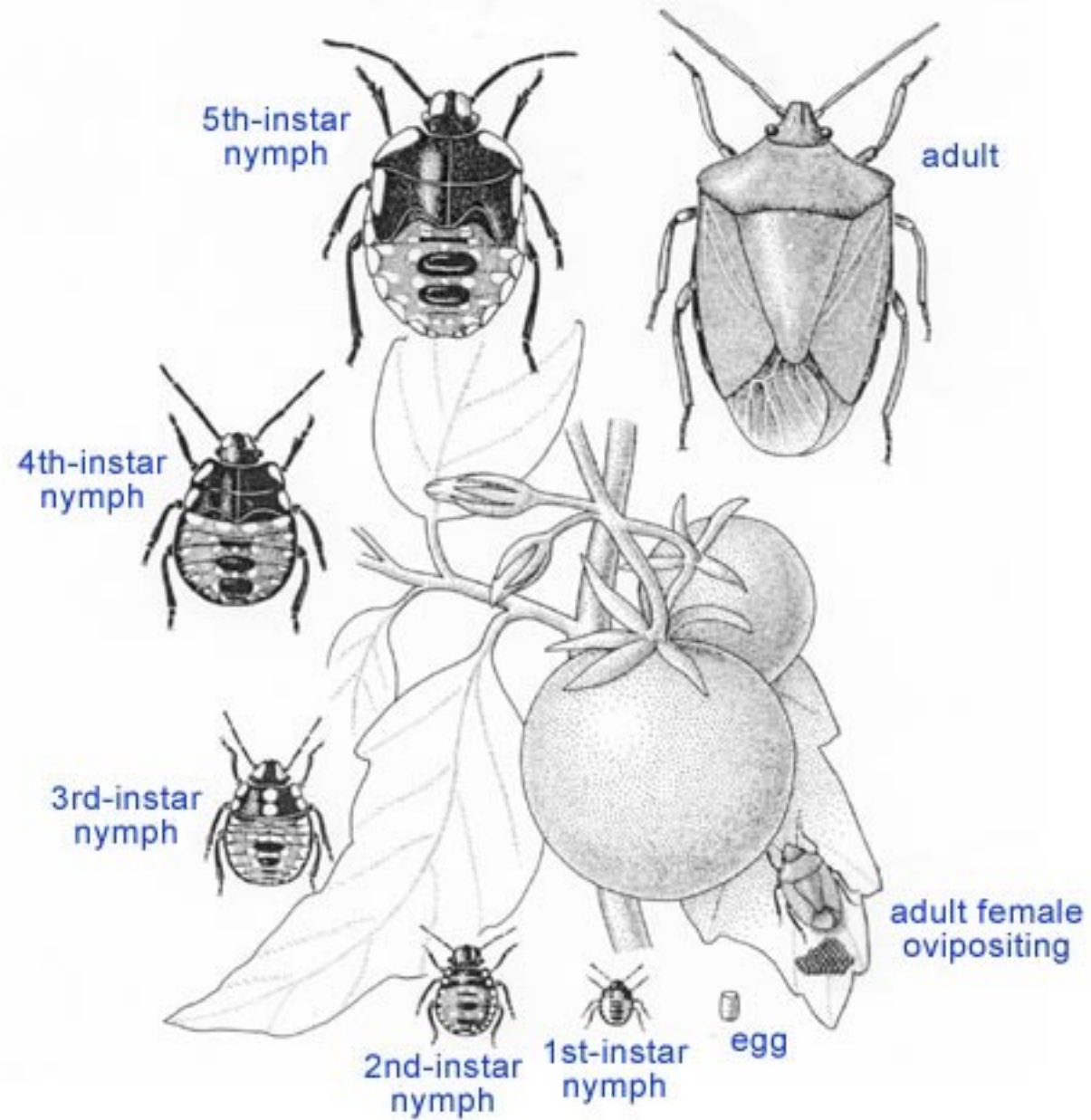




http://www.uwyo.edu/grasshoppersupport/html_pages/fieldgde.htm







<http://entomology.ucr.edu/ebeling/figures/fig056.jpg>

<http://bugs.bio.usyd.edu.au/learning/resources/Entomology/lifeCycles/imagePages/greenBugLifeCycle.html>



National Geographic



BBC



National Geographic



PBS: Nature

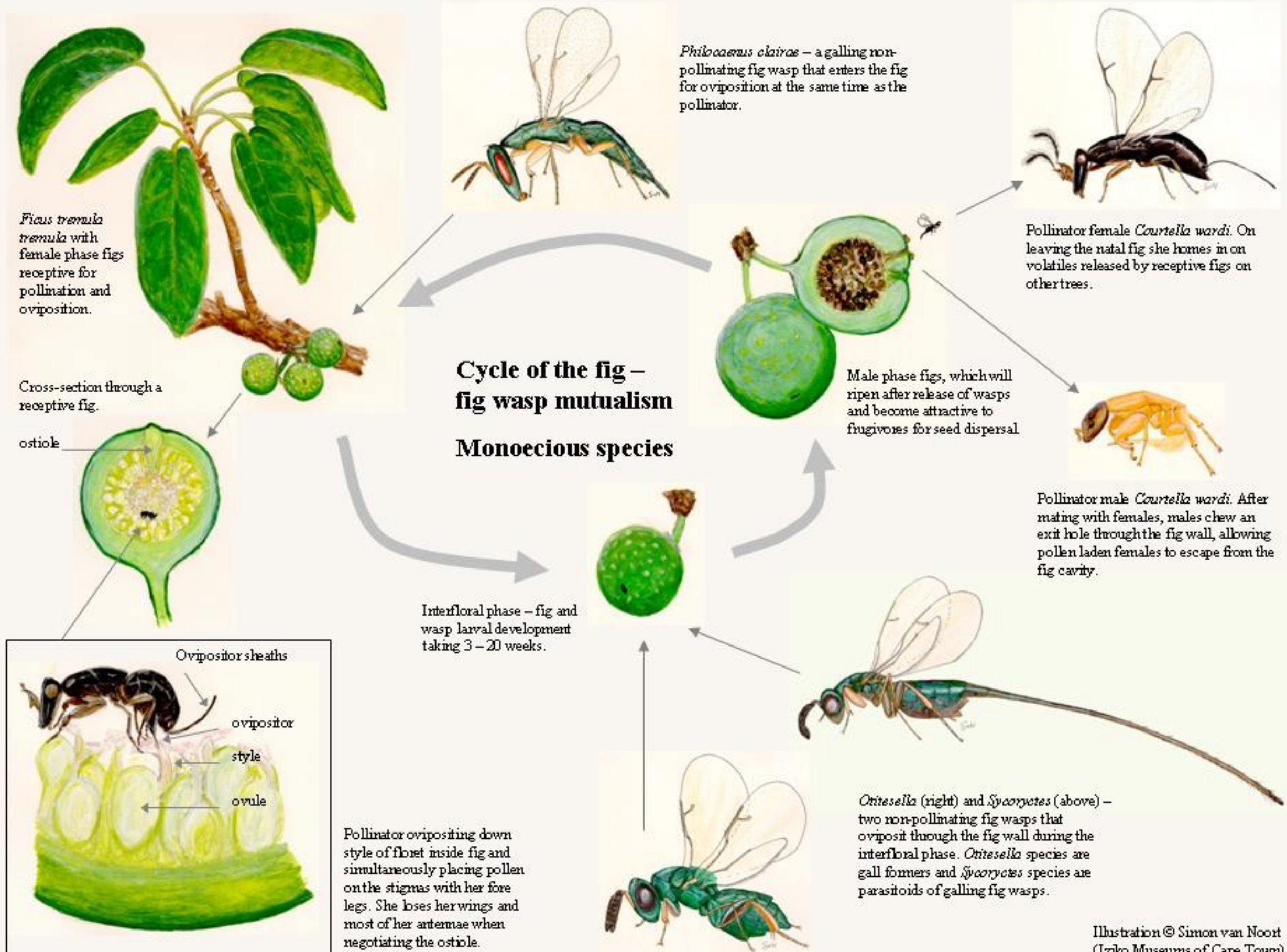


Illustration © Simon van Noort
(Iziko Museums of Cape Town)

Müllerian mimicry

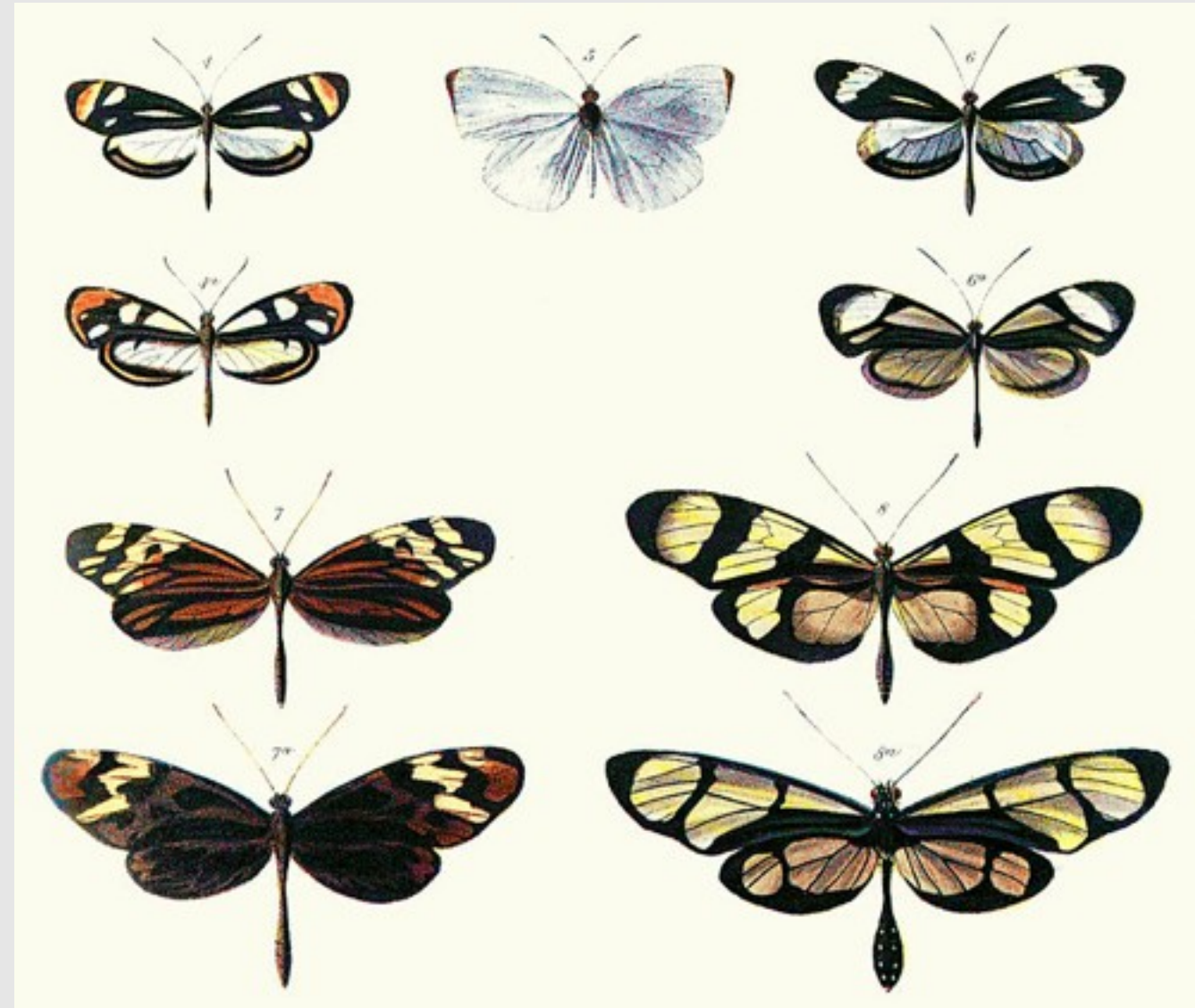
All nasty



Repeating Patterns of Mimicry. Meyer A, PLoS Biology, Vol. 4/10/2006, e341 <http://dx.doi.org/10.1371/journal.pbio.0040341>

Batesian mimicry

Tasty ones look like nasty ones





<http://www.youtube.com/watch?v=a-Vy7NZTGos>



BBC: Life



Toby Barton



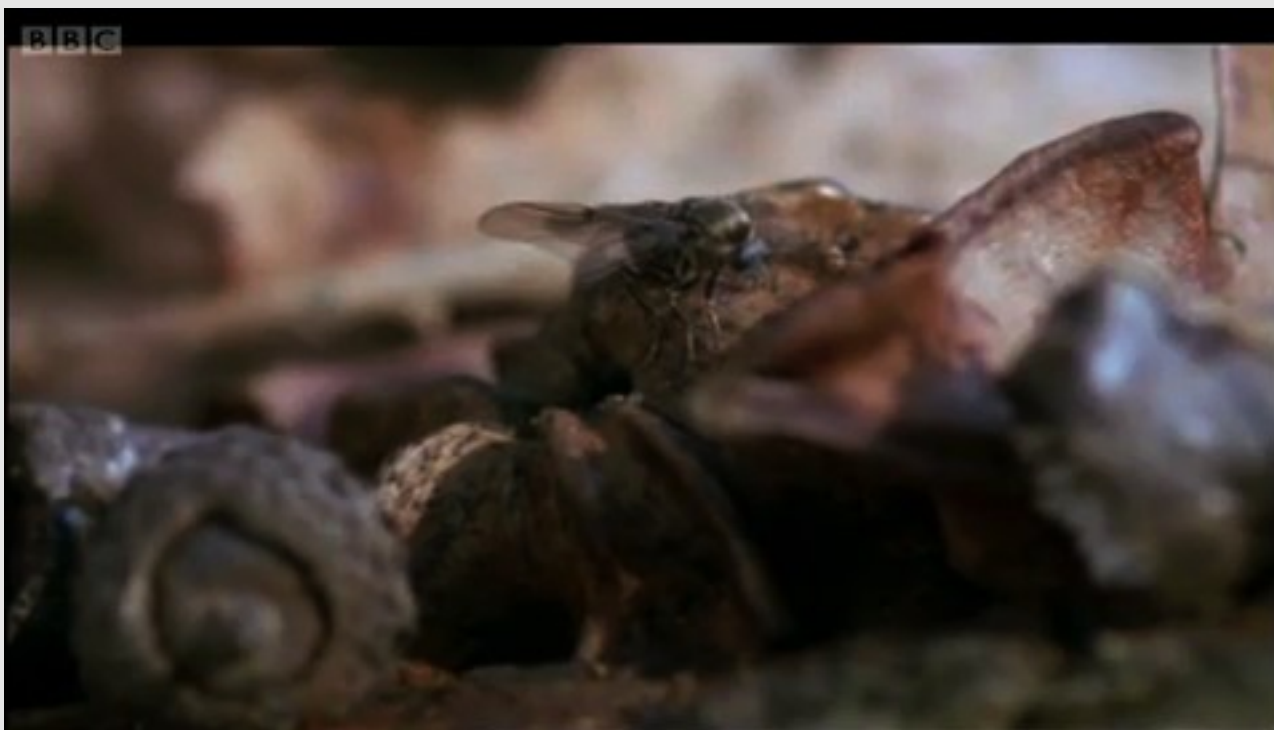
Brian V. [poster on Canon forums]



http://www.youtube.com/watch?v=KYp_Xi4AtAQ



<http://www.youtube.com/watch?v=PVGJSGivl6o>



BBC: Life in the undergrowth



Kent Loeffler, Cornell

