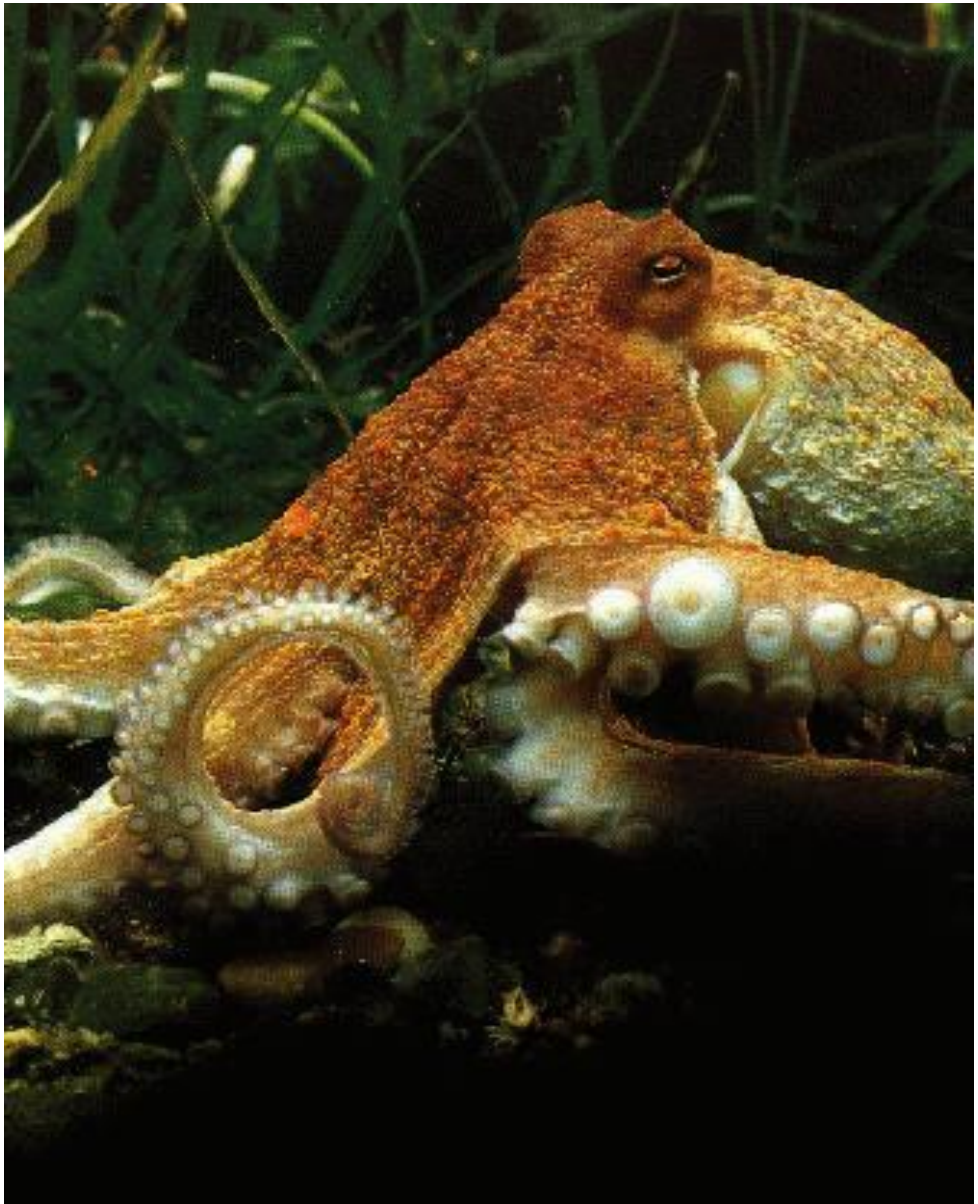
Phylum Mollusca (soft body)

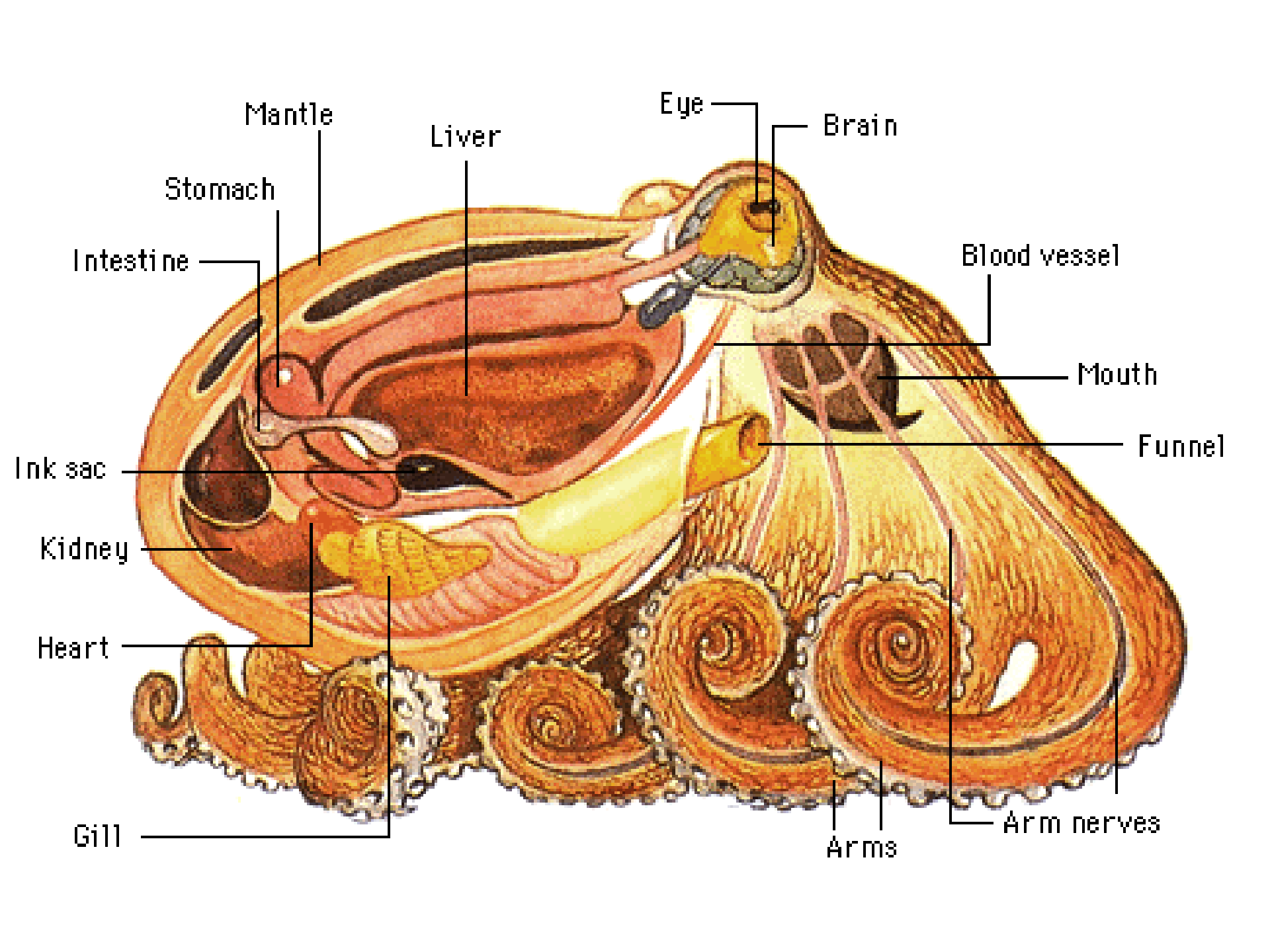
- marine, freshwater, or terrestrial
- **bilaterally symmetrical or asymmetrical**
- **no segmentation**
- have **well-developed digestive and circulatory systems**
- **highly developed nervous system with large brain** with many ganglion (some have image forming eyes)
- extensively folded gills with **"gill heart" (pumps blood back to "systemic heart")**

Phylum Mollusca (soft body)

- has an **organ called a mantle** (fold of tissue over the body) **which secretes a hard shell**
- **muscular mantle for water flow & jet power for fast swimming**
- examples: octopus, squid, cuttle fish, clams, oysters, mussels, scallops, tooth shells, snails, slugs

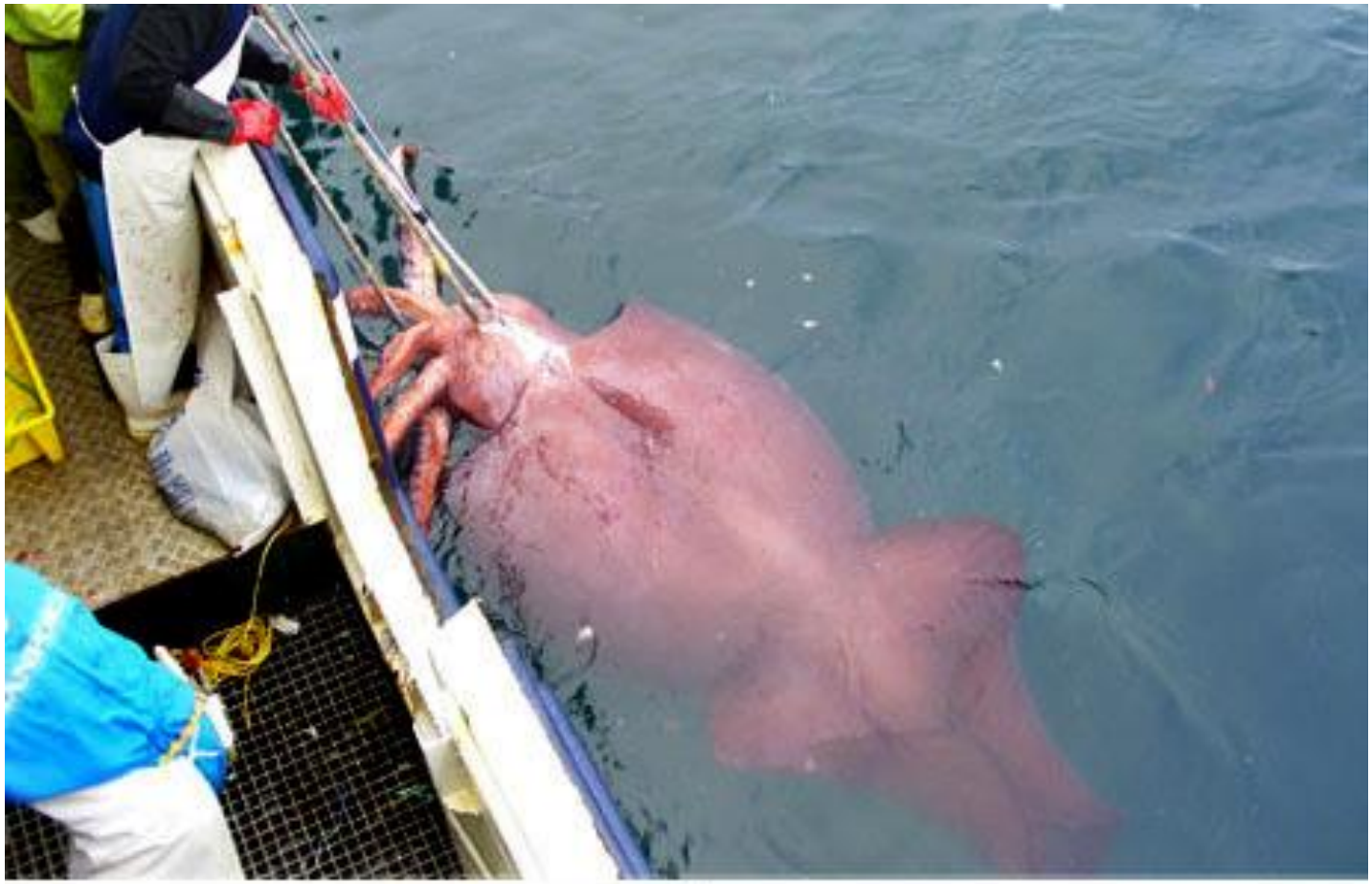
Octopus



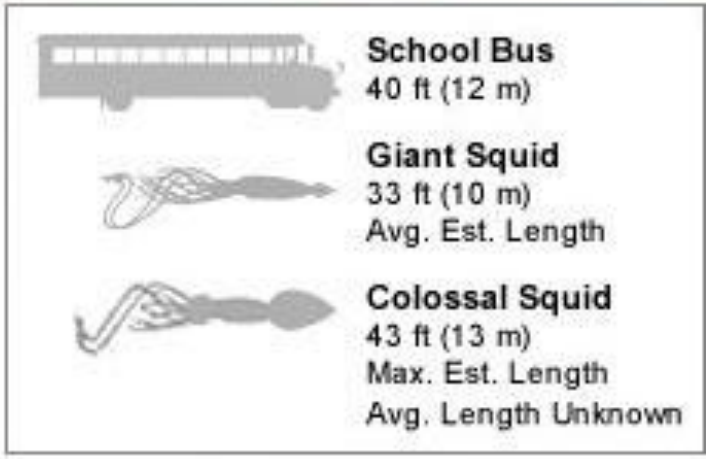

Mantle
Liver
Eye
Brain
Stomach
Intestine
Blood vessel
Mouth
Funnel
Ink sac
Kidney
Heart
Gill
Arms
Arm nerves

Squid

Giant Squid

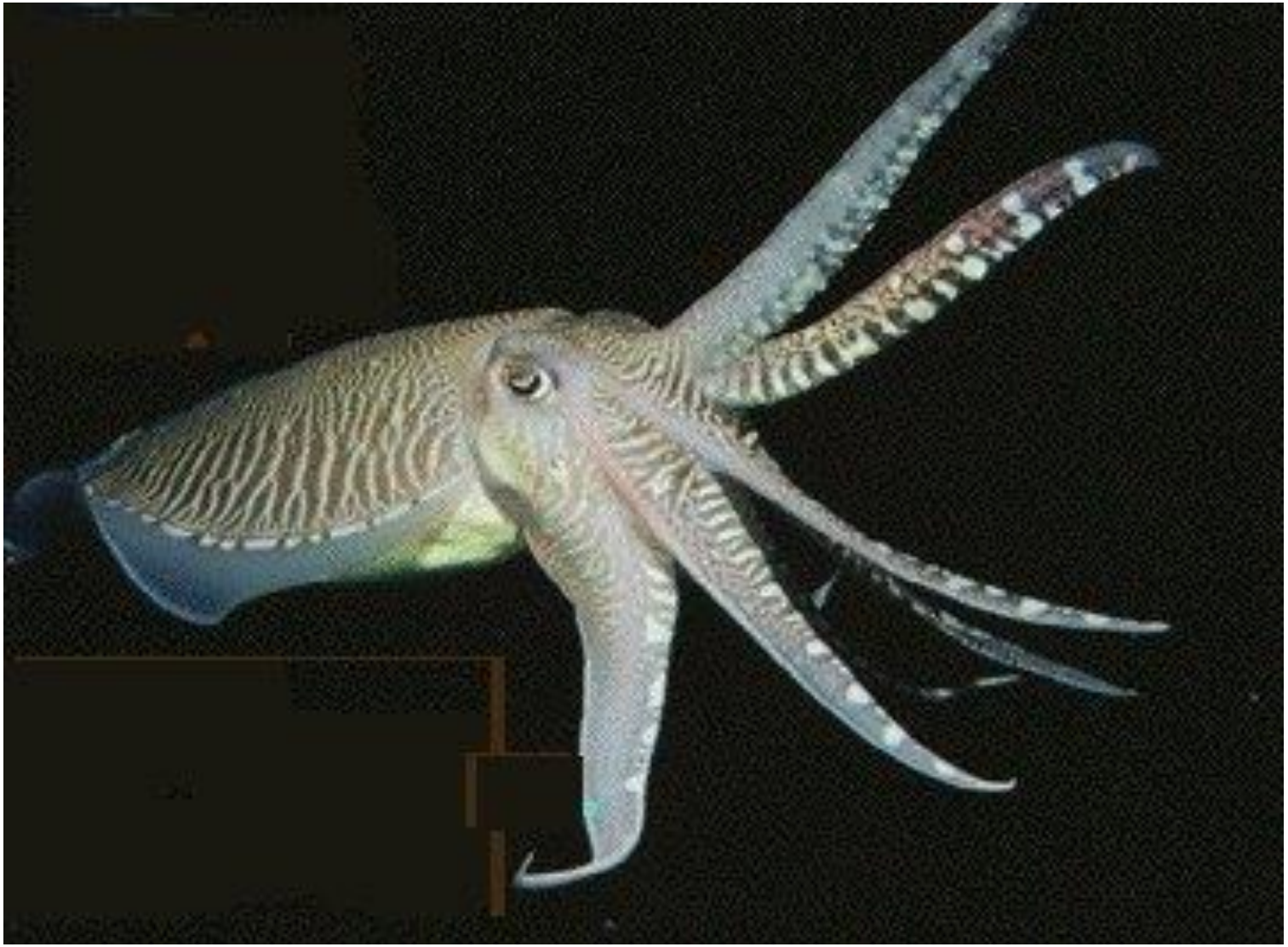


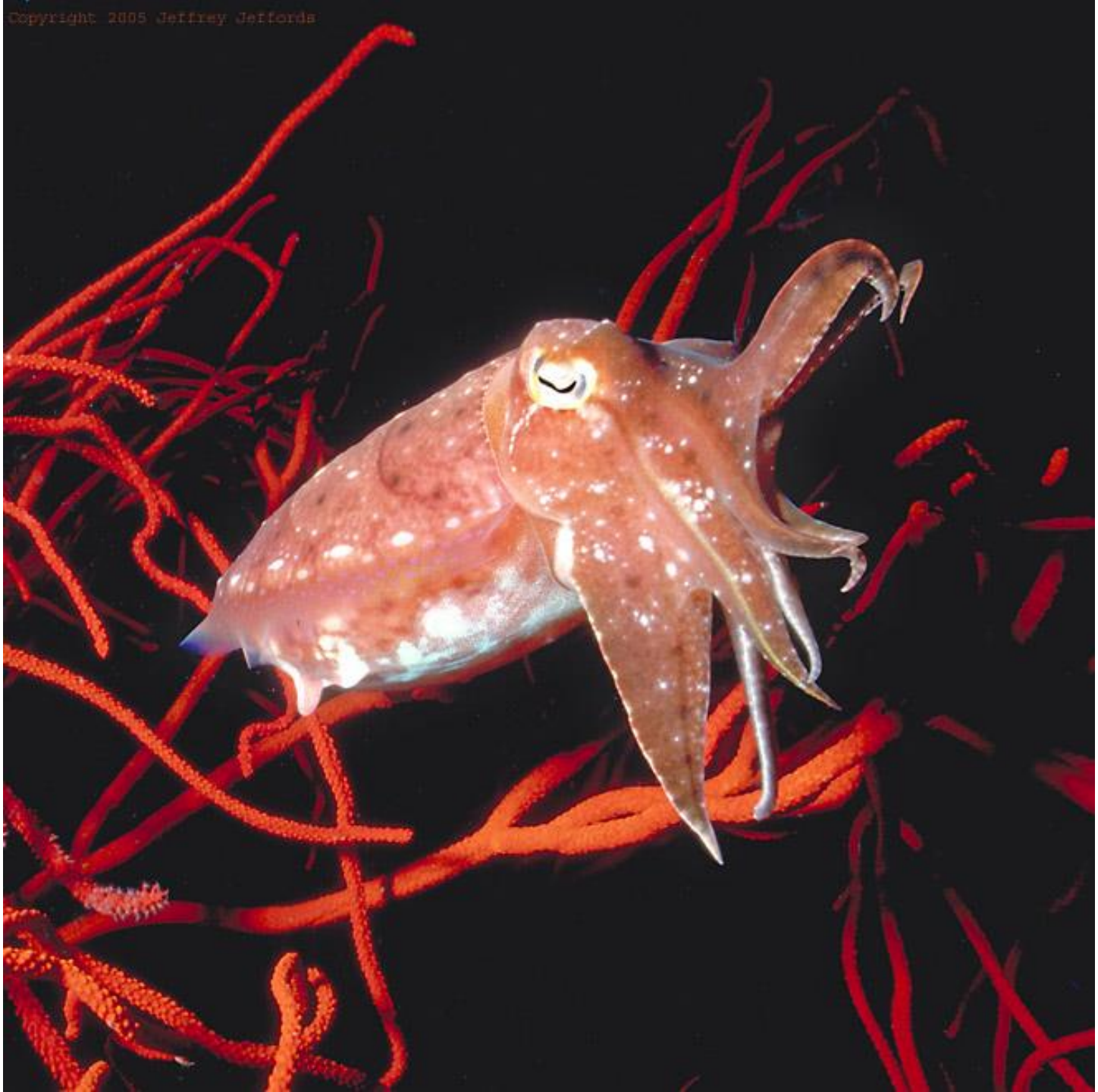
In February 2007, New Zealand fishermen caught the largest squid ever captured. It weighed nearly half a ton (950 lbs and was 33 feet long!)



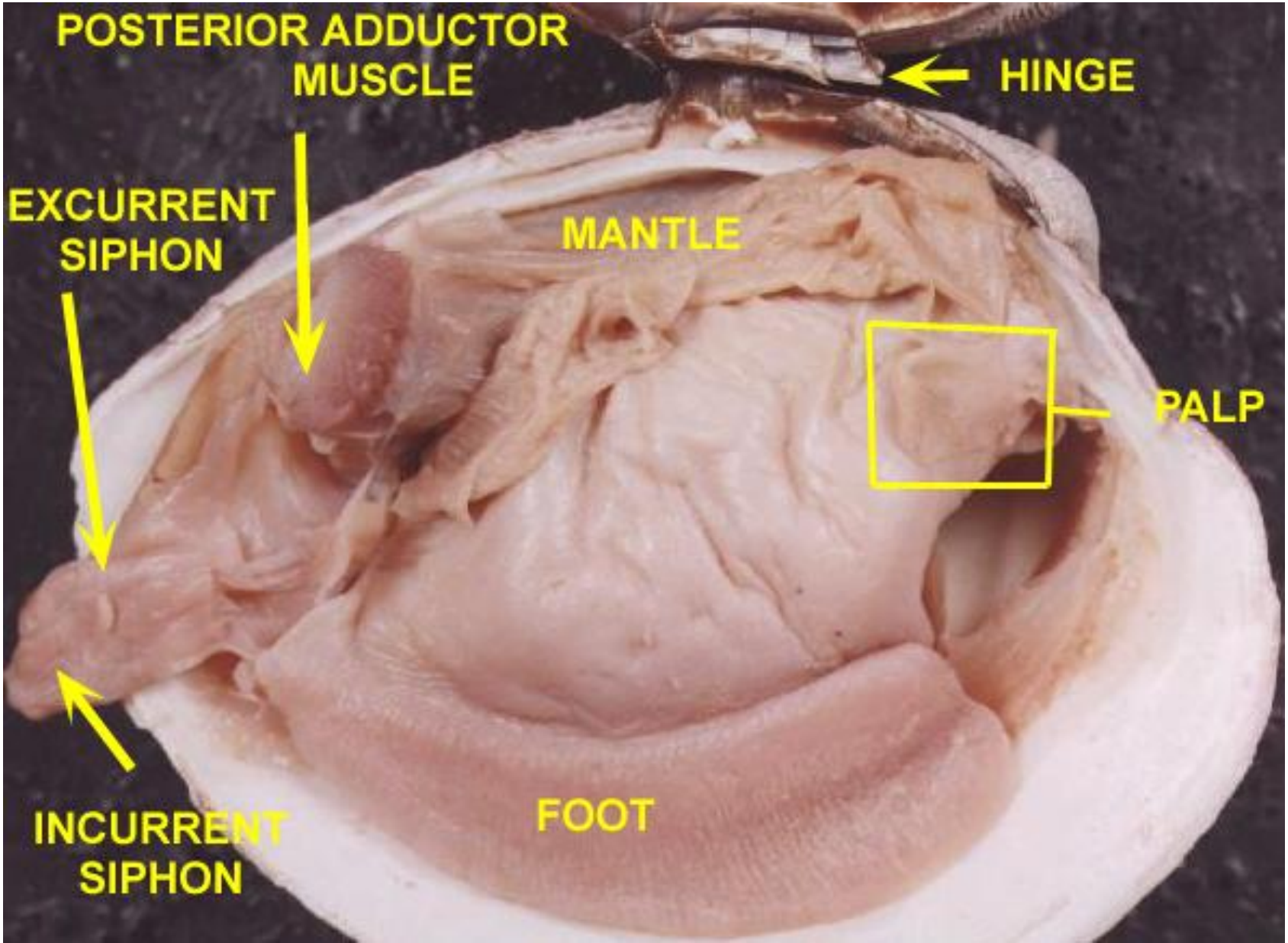

Squidward

Cuttle fish




Copyright 2005 Jeffrey Jeffords

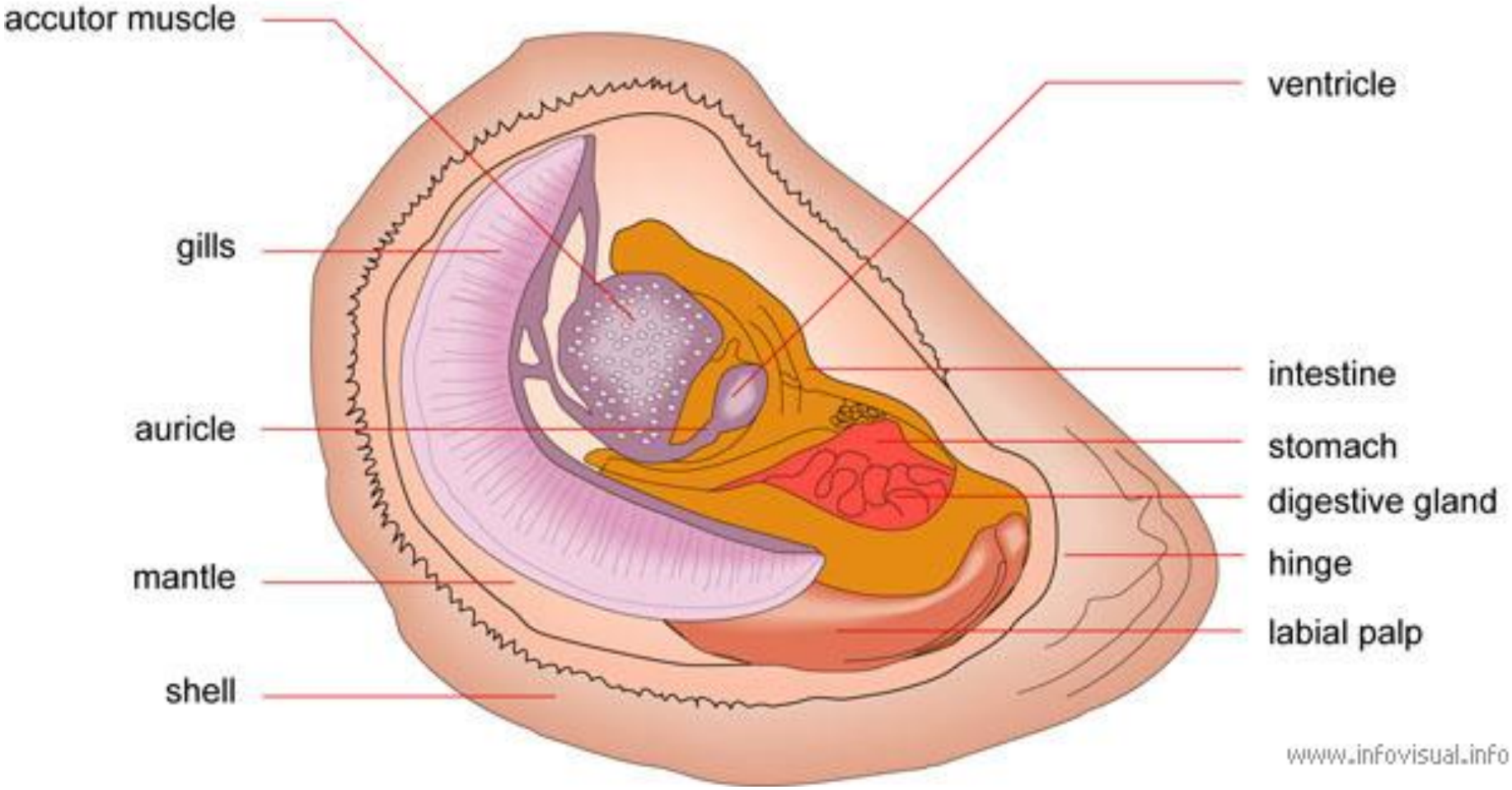
Clams


POSTERIOR ADDUCTOR MUSCLE
HINGE
EXCURRENT SIPHON
MANTLE
PALP
INCURRENT SIPHON
FOOT

Giant Clam

Oyster

OYSTER


accutor muscle
gills
auricle
mantle
shell
ventricle
intestine
stomach
digestive gland
hinge
labial palp
www.infovisual.info

Mussels

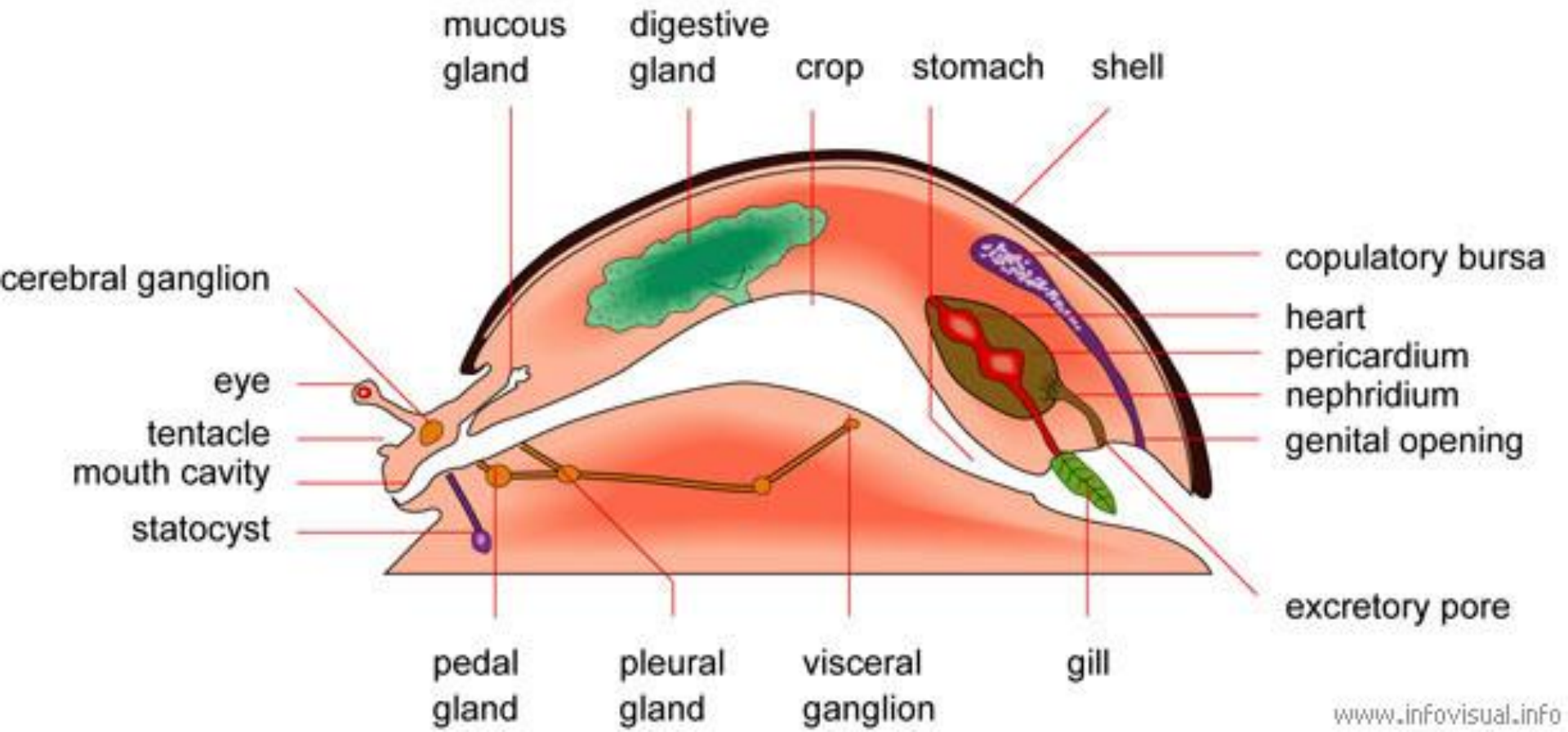
Zebra Mussels

Scallops

Tooth Shells

Land Snails

INTERNAL ANATOMY OF A MOLLUSK



Aquatic Snail


© Robert Kitt

Gary

Slugs

Garden Slugs

Banana Slugs

Blue Ocean Slug (*Glaucus atlanticus*)

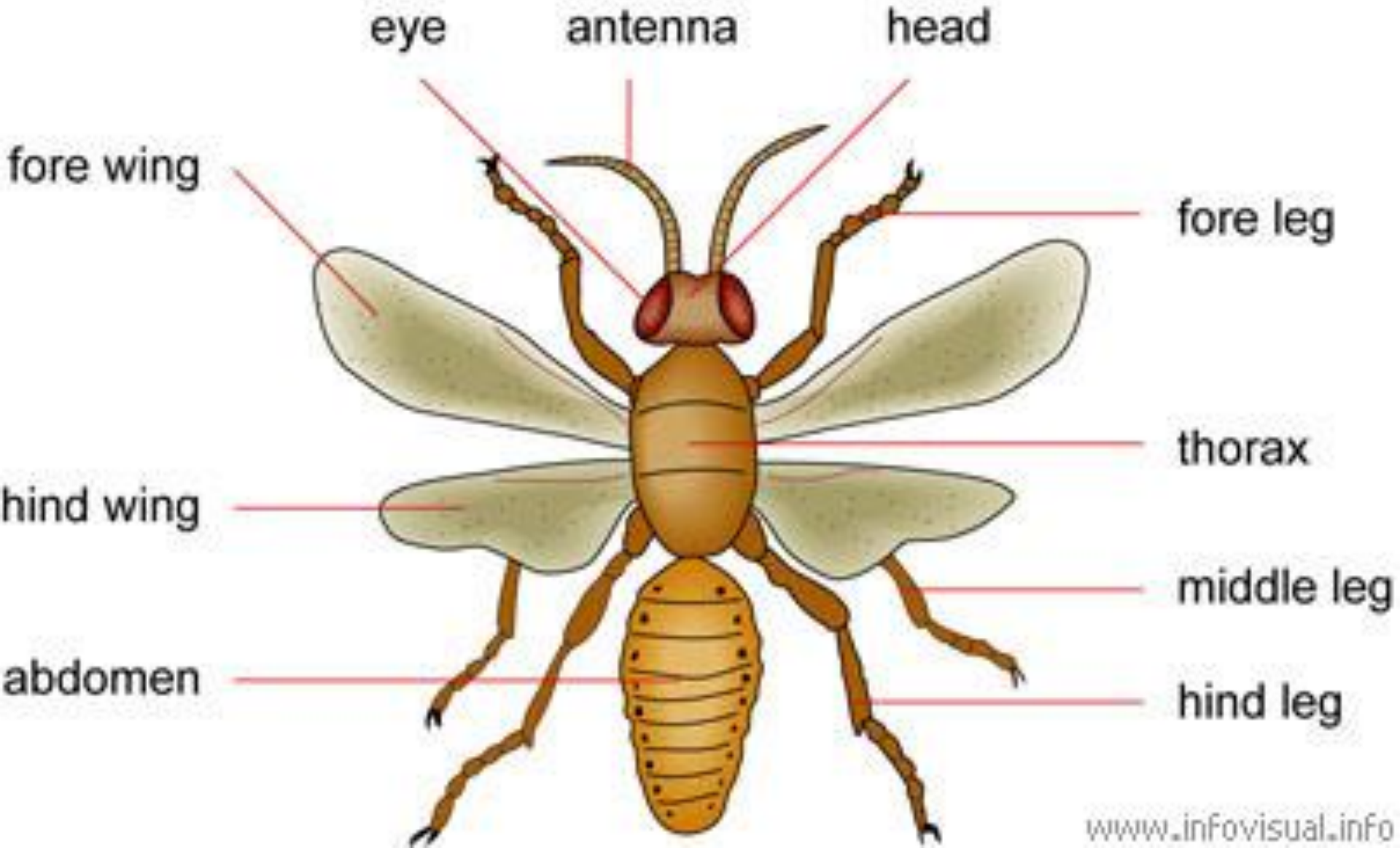
Phylum Arthropoda

- **has jointed appendages**
- marine, freshwater, or terrestrial
- there are over 1 million types of arthropods (more than any other animal phylum!)
- **bilaterally symmetrical**
- **has a ventral, main nerve cord and dorsal blood vessel**
- **nerve cord is solid**
- muscles are inside the skeleton, it **has an exoskeleton**
- **the body is segmented, but the segments are often fused**

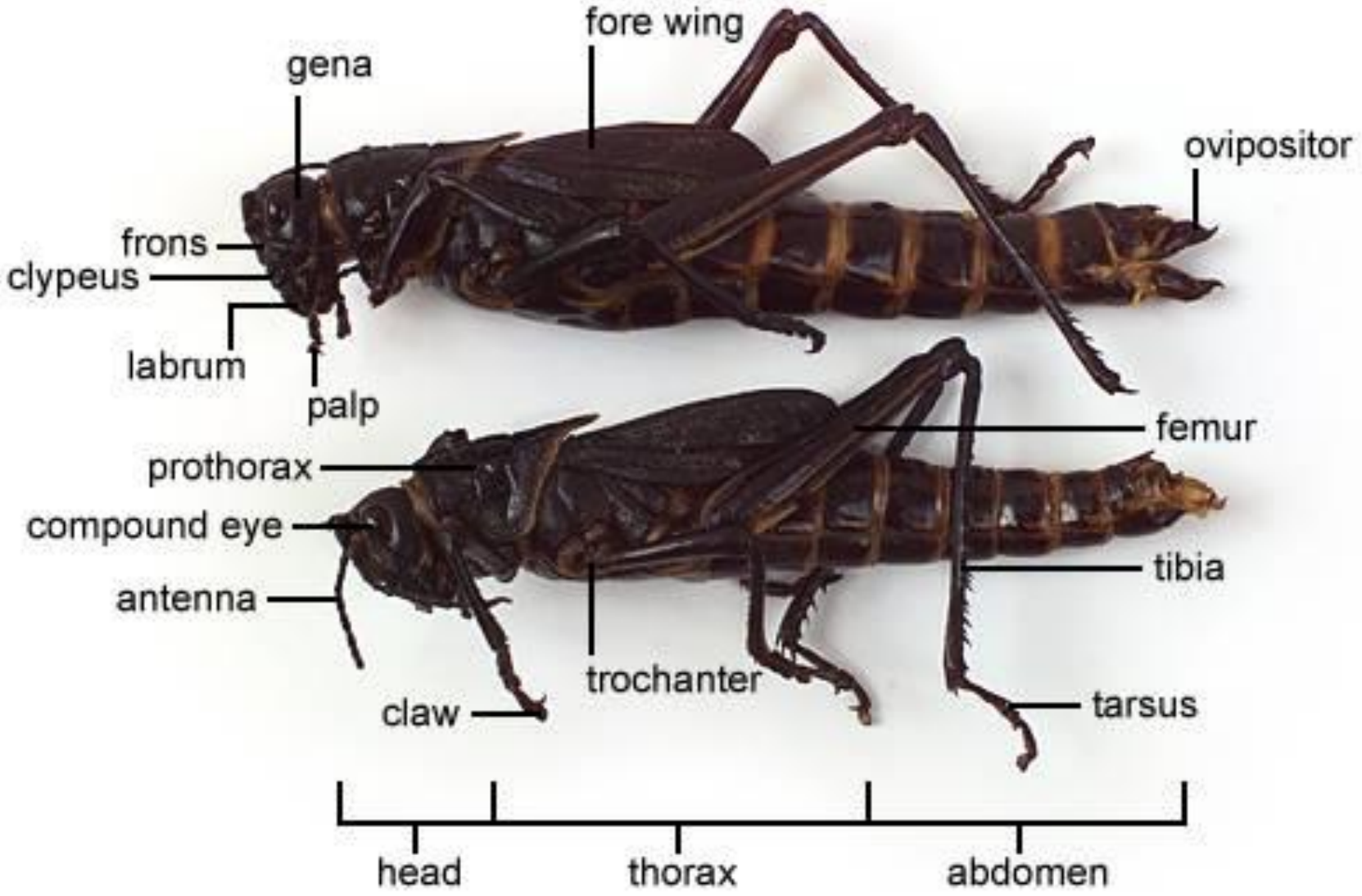
Phylum Arthropoda
Class Insecta

- there are more different species of insects than all other animals combined
- there are approximately 1,800,000,000,000,000,000 insects living on the planet
- has **one pair of antennae**
- the **body is divided into 3 parts - head, thorax, and abdomen**
- has **three pairs of legs on thorax**
- examples: butterfly, bee, grasshopper

MORPHOLOGY OF A FLYING INSECT



Grasshopper - External Features (Female and Male)



Leaf Mimic Insect

Cockroach

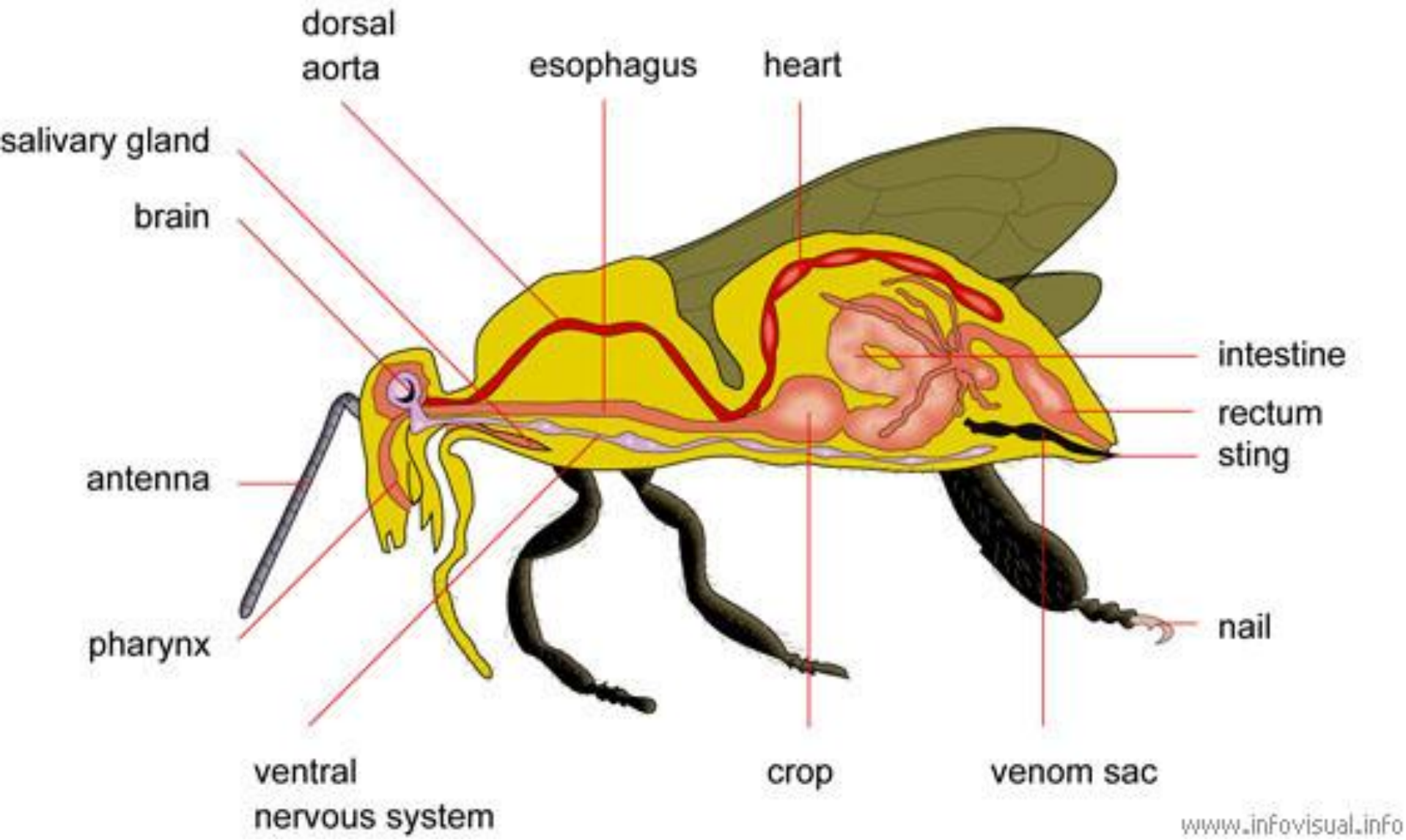
Praying Mantis

Walking Stick

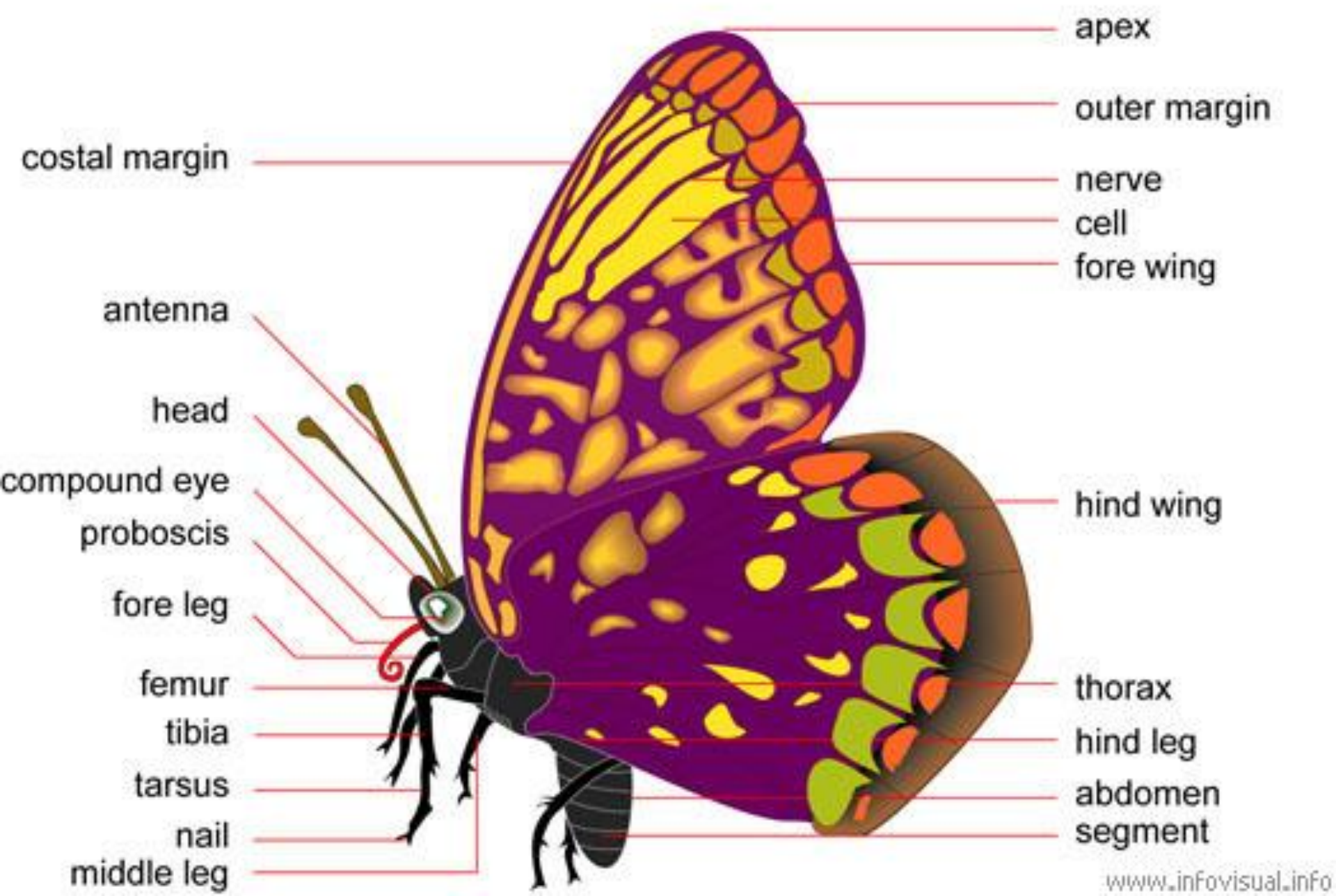
Wasp

Honey Bee

INTERNAL ANATOMY OF A BEE



MORPHOLOGY OF A BUTTERFLY

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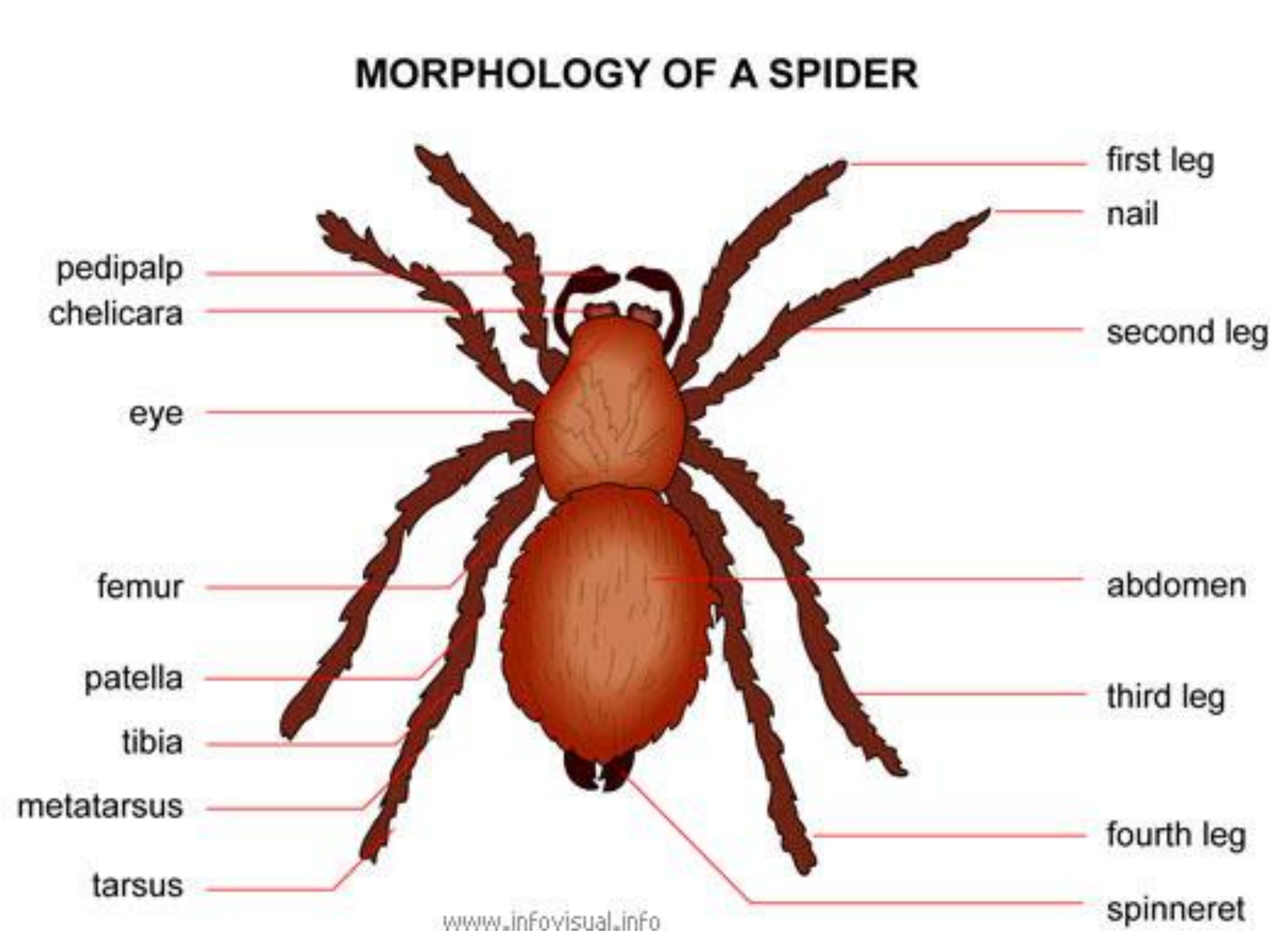
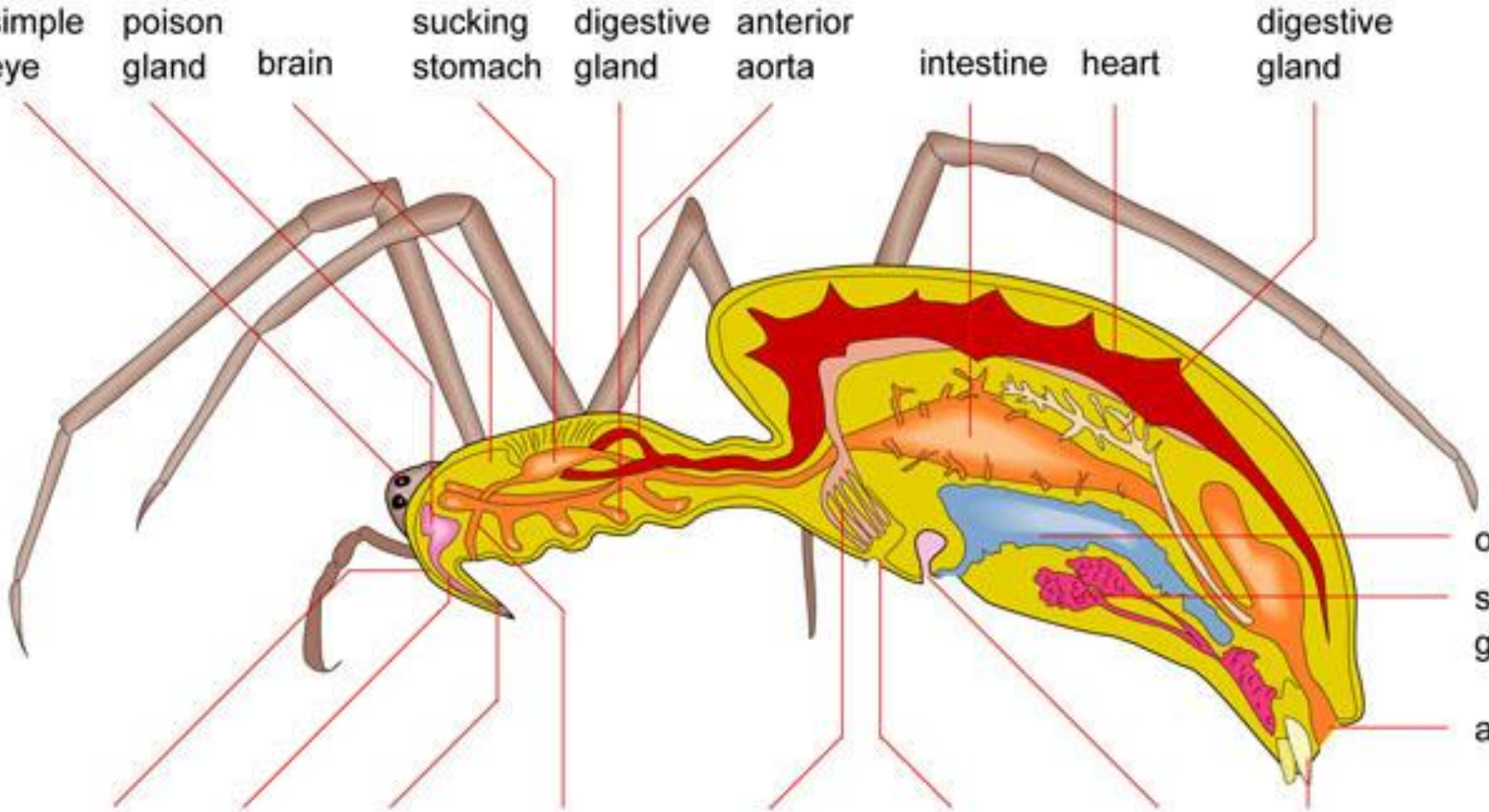
Phylum Arthropoda
Class Arachnida

- **two body parts (cephalothorax and abdomen)**
- has **four pairs of legs**
- **no antennae**
- has **no jaws** – the feeding appendages may resemble claw-bearing legs
- all spiders **have poisonous glands and fangs**, but only a few are harmful to humans
- **some** (orb weavers) **spin silk webs**
- examples: spider, scorpion, ticks, mites

MORPHOLOGY OF A SPIDER



INTERNAL ANATOMY OF A SPIDER



Orb Weavers

– spin webs to catch their next meal!

Picture of a banana spider I took whilst on a hike in Maui

Spider Ant – not a spider at all, just an ant mimicking a spider

Jumping Spider - internal hydraulic system (blood) extends their limbs by altering the pressure of within them. This enables the spiders to jump up to 80 times the length of its body without having muscular legs.

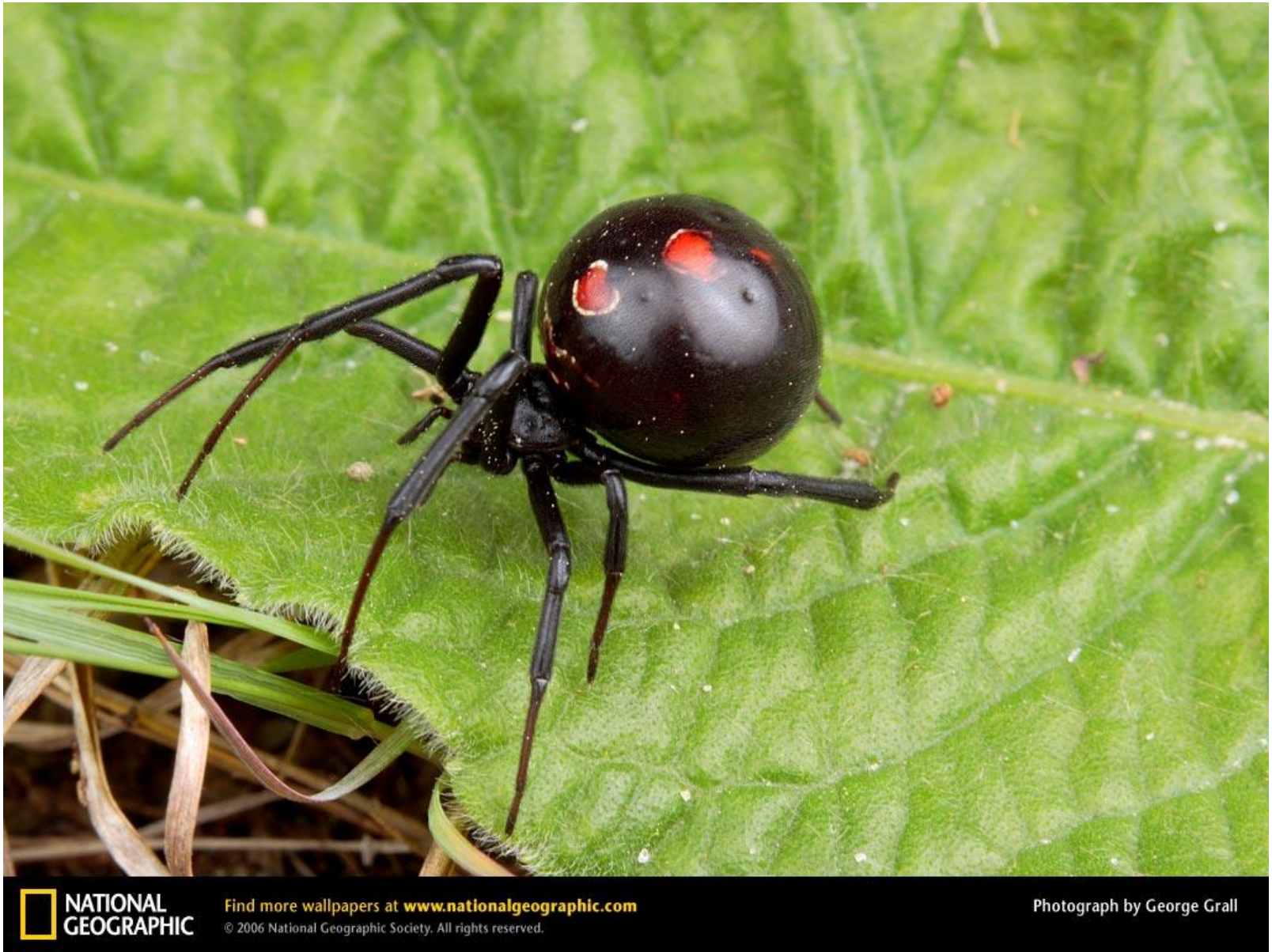
Tarantula

Feeding Tarantula

Black Widow

Adult female black widow spiders are gloss black with an hourglass shaped marking on the underside of its abdomen.

The venom is extremely potent. (15 times more potent than that of the rattlesnake or cobras)



Australian funnel-web spider

The funnel-web is the most poisonous to humans


Baixaki
30 JUNE 2004
sony.com/spider-man
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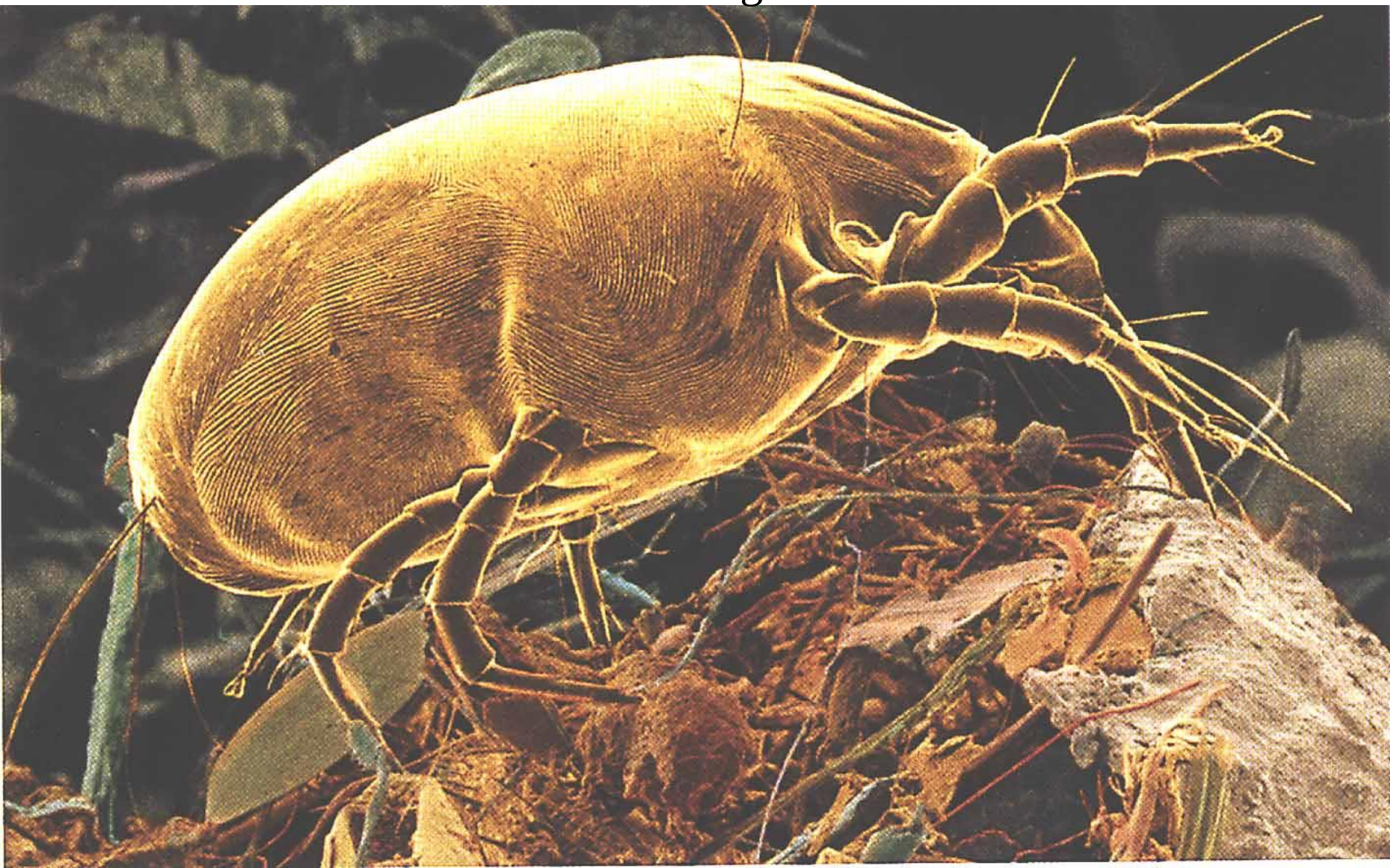
MARVEL
COLUMBIA PICTURES

Scorpion

Wood tick

Dog Tick

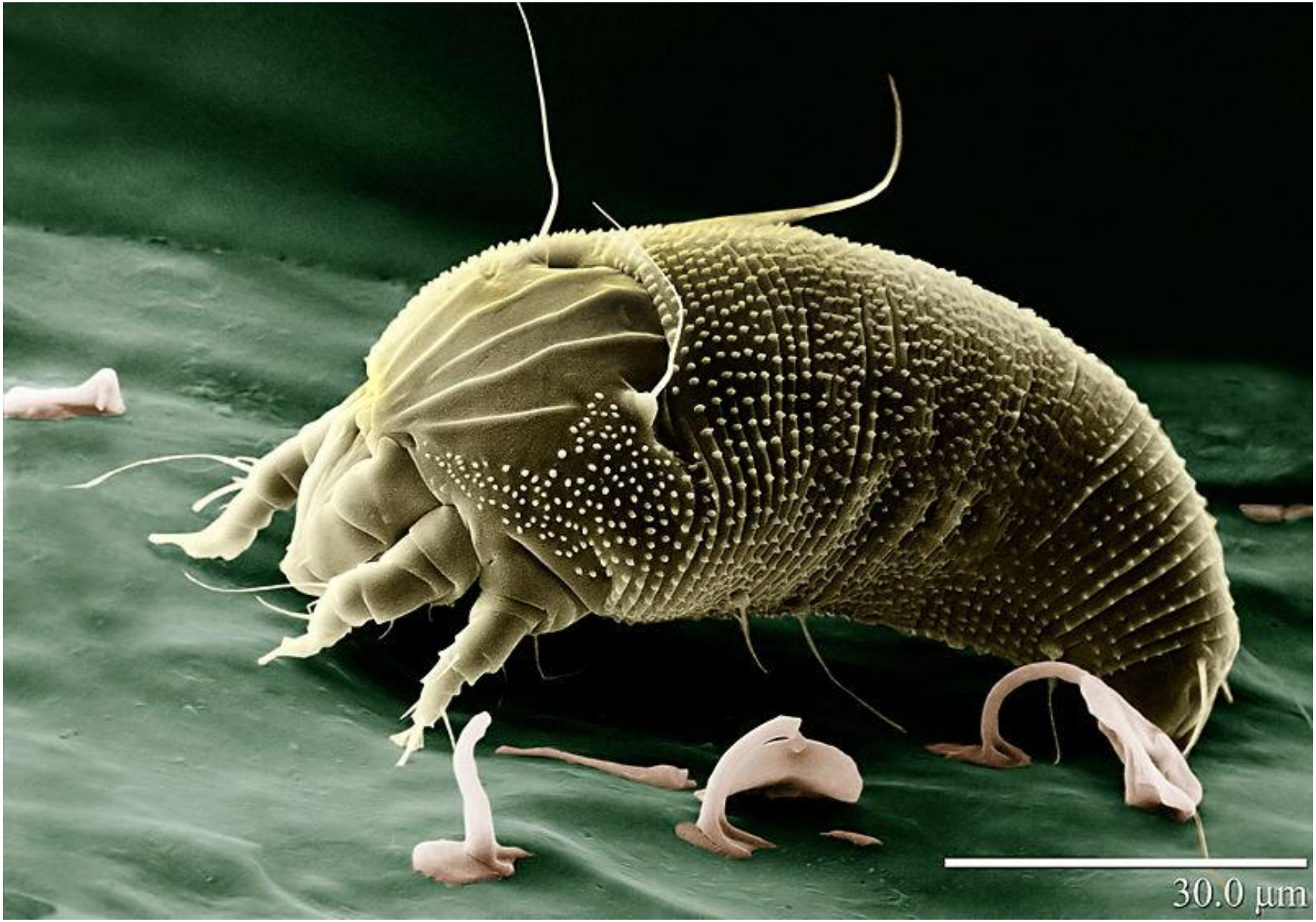
Common household dust mites live in the fine layer of minute dust particles that continually settles on household items. They are associated with allergies.



Dust mites favor homes with high humidity levels and constant warm temperatures.

Rear end of tiny mites feeding on the dead skin cells of an eyelash hair follicle.

Rust mite – live on white pine needles



Flat mite – common in and on various citrus fruits

Phylum Arthropoda
Class Crustacea

- mainly marine
- has **2 pairs of antennae**
- **3 body parts with first two often fused (cephalothorax)**
- has **respiration by gills**
- examples: crab, lobster, crayfish, shrimp, barnacles

Fiddler Crab

Lobster

Crayfish

Phylum Arthropoda
Class Chilopoda

- **Carnivorous**
- there is **one pair of legs on each segment**
- has **one pair of long antennae**
- the entire **body is segmented**, **but flat**
- has a **pair of poison glands behind head**
- example: centipede

House Centipede

Chinese Redhead Centipede

Phylum Arthropoda
Class Diplopoda

- feed on plants – **herbivorous**
- there are **two pairs of legs on each segment**
- has **one pair of long antennae**
- has **no poison glands**
- example: millipede

Common Millipede