Animal Diversity II: Dissection of the squid (Loligo pealei)

1) Obtain a fresh or preserved squid from your TA.

2) Find the siphon. It is a fleshy tube at the base of the head. The side with the siphon is the posterior side. The tentacles are the ventral side; the tip of the tail is the dorsal side.

Thus, the squid would look like this if it were in the same orientation as the shark shown under the “anatomical glossary”:

3) Lay the squid on its anterior side - siphon up.

4) You will see a started incision in the mantle, continue this to the dorsal end and peel the sides of the mantle apart. You will see something like the following page.
Tail

Digestive gland at dorsal end

Thin membrane sac containing:
- sinus venosus (posterior vena cava)
- heart
- under heart:
  - firm sac = stomach
  - thin-walled sac = caecum

Gill:
- one on each side.
- ridged structures extending away from heart and attached to mantle

Liver:
- large sac with shiny covering.

On posterior (top) surface of liver:
- anterior vena cava (vein)
- black bag = ink sac*
- clear tube = digestive tract*
* both end at anus

Anus

Siphon

Head
5) Trace the red and blue blood vessels as best you can.
6) Using a pick, gently pick open the sac that contains the heart, etc. The stomach and caecum are very fragile. Remove the heart. The siphon retractor muscles look like rubber bands.

Look carefully at the siphon. The squid squirts water out of the opening in it.

Try to trace the digestive system as it is arranged in the squid. Slit it open and examine the textures inside the stomach and caecum.
If the digestive system were stretched out straight, it would look like this:

caecum = a blind pouch in the digestive system where food is digested and/or absorbed

ink gland = squids squirt black ink when threatened. It blinds the attacker and inhibits its sense of smell.

7) Carefully remove the liver. Lift it starting from the dorsal (tail) end. Using a pick, detach the connective tissue and the digestive tract (clear tube) as you lift out the liver.

8) Cut through the middle of the head from the posterior side. Do this slowly and spread the sides apart to reveal the mouth and beak. Trace the digestive tract. Cut open the mouth to examine the beak and ‘teeth’ (radula).

9) Cut open the eyes and look at the lens (it will be firm & clear - you can look through it) and retina (black light-sensitive membrane at the back of the eye).

10) Try to look at the gills of the fresh squid under a microscope. How do they differ from the
fish gills?

11) If you have a fresh squid, try to make a blood smear from the heart or sinus venosus. What kinds of blood cells do you see?

12) Take a small amount of material from the gonad and add one drop of water. Cover it with a cover slip. See if you can find the male spermatophores.

13) The skin of the squid pulls off the body. Cut a small piece of it and put it on a slide with a drop of water to see the chromatophores.

14) Place a piece of the arm or tentacle on a petri dish and look at it under the dissection microscope. Find the sucker rings.

12) Clean up. You are done with the dissection.

Clean up
Place your preserved squid and any squid parts into the bag labeled “preserved squid waste”. Place your fresh or frozen squid and parts into the bag labeled “fresh squid waste”. These will be disposed of separately. Other trash goes into the barrel. Wash all of your dissection tools and tray out well with soap and water and leave to dry on the counter. Wash down table.

For the lab practical, be able to identify: tentacles, arms, mouth, beak, siphon, mantle, systemic heart, stomach, caecum, gills, liver, ink sac, anus, gill hearts, siphon retractor muscles.

Be able to draw the respiratory system, the circulatory system and the digestive system of the squid including the direction of the flow (of food, blood or oxygen, etc). Also be able to answer all questions in the lab manual.

Lab assignments: Have you TA check off your drawings for the exterior, the respiratory, circulatory and the digestive systems for the squid. Take these home as part of your study guide for the lab practical.