Practice makes perfect - almost! Work on larger species first to gain experience. Don't be ambitious, dealing with tiny moths is an art - but things do become easier...

Dissection - Technique

1/ Place the abdomen into a hot solution of potassium hydroxide. *Warning! - KOH is highly caustic, boiling may cause it to leap from the tube and onto your skin or eye!* The time taken to digest soft parts will depend on the solution temperature. Once ready, the abdomen will attain a translucent appearance and may tend to sink unless air bubbles prevent it from doing so. It is better to undercook than to overcook.

Tip: A 2 x 3/4 inch glass tube will hold enough solution to do many pugs or micros. Because of evaporation, top up with water every now and again

2/ Remove the abdomen from the KOH solution with either a hooked pin or a pipette and transfer to a dish or glass block containing purified water (not tap water!). Under the microscope, use small angled pins or a fine brush to remove as many scales as possible. Using pins, apply gentle pressure and stroking movements to the abdomen to push out the gunk. You should soon be able to see whether you have a female or male, and the procedures for dealing with each differs.

Tip: Work towards slowly flattening the abdomen, but make sure it is flattened ventral side up or down, not laterally.

The figured example is a coleophorid. In the first image the abdomen is lying on its side and needs to be rolled over until it's lying on its back. In the second image, the abdomen has been gently flattened and some scales have been removed, allowing you to see some of the internal structure. An ovipositor has emerged from the left-hand side, so this is a female. (It's often possible to identify the species at this stage.)

3/ *Go to.....*

Females **Males**

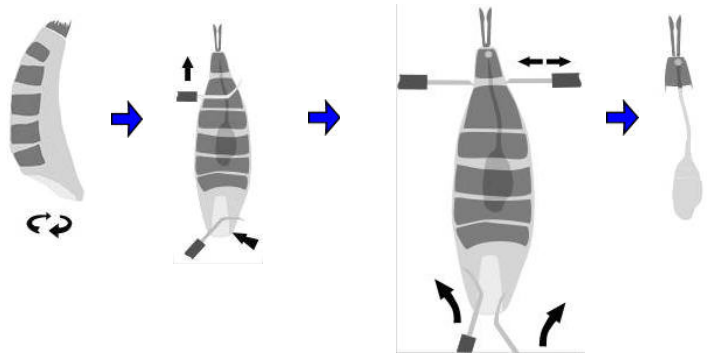
Technique - *females*

3/ Typically the next stage will involve removing part of the skin. First you should identify the end bearing the ovipositor, near to which will be found an opening called the ostium (see **Morphology** on this site). This part should remain intact, but the segments beyond can usually be removed. Inside the body will be a bag-like structure called the bursae copulatrix and from this to the ostium is a tube called the ductus bursae, try not to damage either. Make a cut with a pin or fine scalpel at a junction between two segments below the one bearing the ostium. Place two angled pins inside the end of the body away from the ovipositor end and slit the skin open until you reach the initial cuts. Remove the skin and hopefully you'll be left with the ovipositor, the last segment bearing the ostium, and the ductus bursae and bursae copulatrix.

Photography: This is a good time for a photograph as alcohol can distort some delicate structures. The genitalia can be turned in the water in order to display important details.

4/ The genitalia should now be immersed in a water/alcohol mixture in several stages, for example 30%, 60% and finally 100% alcohol. This helps the cleaning process and prepares the body for the slide stage. In 100% alcohol, stain (if desired) can be added. For females, Chlorazol Black (suspended in alcohol, not water) is preferred. Use only a small amount of stain - overdoing this can mask important features. If you do over-stain, follow the suggestions on our overstaining page.

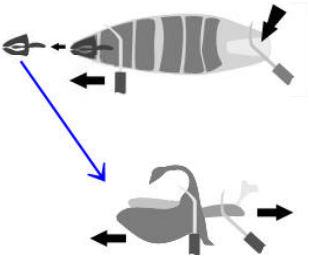
5/ The genitalia can now be placed in Euparal mountant on a slide. Alcohol and Euparal will make things very brittle, so care is needed whilst manipulating the structure. Use Euparal essence if needed to keep the mountant runny and to finish off the edges once the cover slip has been placed. Apply the cover slip at an angle to help prevent air bubbles. Small air bubbles usually disappear in Euparal. Label the slide, including a reference number to link it to the specimen.



Males

Technique - *males*

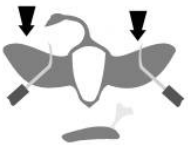
3/ The male organs include the clasping arms and aedeagus, are clustered together at one end of the body - these should by now be obvious (see **Morphology** on this site). Hold the opposite end of the body firmly with the heel of an angled pin and, with a second angled pin, gently stoke towards the valves. With luck these will float free of the body, but may require carefully tearing the skin until they become detached. If enough scales have been removed, you should see enough detail to avoid damaging anything of value.



4/ The skin may be disposed of (although the skin in some families, such as coleophorids and gelechids, have good diagnostic features). Clean away as much gunk as possible. If the aedeagus is to be removed, do it at this stage. Removing the aedeagus may cause damage, so proceed with caution: lay the valves on their side and hold down firmly with the heel of an angled pin; use a second pin to pull the aedeagus away. Sometimes it is desirable to evert the thorn-like structures inside the aedeagus (the cornuti), but this can be tricky because of the small size of the material. If it must be done, try inserting a small hooked pin into the end of the aedeagus and dragging out the cornuti. Alternatively, slit open the wall of the aedeagus.

Tip: Refer to a genitalia diagram in a book of the family you are working on and aim to copy what you see there. In some families it is not possible to detach the aedeagus, or to flatten the valves, or the parts may need to be presented from a certain angle.

Photography: The aedeagus can be photographed at this stage, before the actions of alcohol distorts it.



5/ The valves should be cleaned of scales and hairs, but stout spines should be left in place. Carefully open the valves, removing any tissue that prevents them from doing so. At this stage, stain with Eosin, Mercurochrome or Chlorazol Black. Use only a small amount of stain - overdoing this can mask important features. (If you do over-stain, follow the suggestions on our overstaining page.) Immerse these (and the aedeagus) in a water/alcohol mixture in several stages, for example 30%, 60% and finally 100% alcohol. This helps the cleaning process and prepares the structure for the slide stage. At each stage open the valves, if necessary turning them upside down and with the heel of a pin press down on the back against the glass surface. The idea is to use the alcohol's stiffening actions to encourage the valves to remain fully open of their own accord. In 100% alcohol, stain (if desired) can be added.

Transfer to Euparal on a glass slide and if needed re-open the valves. Arrange the aedeagus close by. Apply the cover slip at an angle to help prevent air bubbles. Small air bubbles usually disappear in Euparal. Label the slide.

Photography: Valves are normally displayed flat, but in Euparal small specimens may be able to partially spring back, disguising their shape. Consider making a temporary slide for photographic purposes: arrange the valves on a glass slide with alcohol as a mountant and apply a cover slip, keep feeding in alcohol as it will evaporate quickly. Once the shot has been taken, carefully remove the slip and apply Euparal to the specimen.

Females