Collecting Odonata (Dragonflies, including Damselflies)

Collecting
Always gather collection information and ensure that it is easily related to each specimen (see below). Record exact locality (including, if possible, UTM or lat/long coordinates), date, time, collector's name, and any pertinent habitat and behavioral information -- data on the type of water body, dominant plants, reproductive behavior, etc. are extremely useful.

Larvae
Collect live larvae by sweeping aquatic habitats with a dip net. Anisoptera larvae are best kept in containers with a bit of wet moss or other vegetation to keep the humidity high. Back at base, drop them in water that has just come off the boil; leave them for 30 seconds, remove and place on paper toweling to remove excess water. Store in 70% ethanol. This heating coagulates the protein (preventing the disintegration of internal tissues) and preserves the color pattern much better than placement directly into alcohol does. Hot water wrecks the caudal lamellae of Zygoptera, however. I put damselfly larvae directly into 70% ethanol in the field, then replace it with fresh ethanol after returning to base.

Exuviae (cast larval skins) should also be collected from aquatic plants, rocks, logs and other supports. I prefer to keep exuviae in 70% ethanol. You can also keep them dry and pin them through the base of the wing cases, placing a small drop of white glue at the point where the pin exits the base of the thorax ventrally.

Adults
Use a long-handled aerial net. A net opening of at least 18" is recommended. Some collectors feel that a dark net bag (black or green) is less conspicuous to dragonflies, and thus is more effective than a white one. White nets make it easier to find the specimen in the net and I generally prefer white because I have found it actually attracts certain groups, namely gomphids (club tails). A wide mesh (but small enough to hold the smallest specimens) is preferred because this reduces air resistance and allows a faster swing. A large mesh may not be satisfactory if you're also collecting insects other than Odonata.

Observing patrolling dragonflies before swinging away often pays; positioning yourself in the most advantageous location, especially if it is somewhat concealed, is usually fruitful. Move deliberately. Refrain from waving the net around; keep it as inconspicuous as possible. Swing at fast-flying agile species from behind as they fly by; many will easily dodge a net swung head-on.

When an adult specimen is captured, place it alive in a glassine envelope (available in several sizes -- I prefer 3.125" x 5" -- at stamp collector stores). Clip one or both of the bottom corners of the envelope; this will allow the acetone to fill and drain from the envelope easier (see below). The wings should be together above the back. In general, put only one specimen in each envelope; they can damage each other. But place pairs caught in tandem or in copula in the same envelope if possible; face them away from each other. If they are too large to go together in a single envelope, make certain that the

fact they were mating is indicated on both envelopes. The collection number (cross-referenced to field notes) or full collecting data must be written on the envelope in soft pencil, india ink or other ink that is insoluble in acetone (if the acetone treatment describe below is used).

Teneral (recently emerged) adults are fragile and preserve poorly. Place them in paper bags for a day or two so that the cuticle hardens and the color pattern develops. If collected while emerging, the adult should be placed in a bag and the associated exuviae should be kept and cross- referenced to the adult specimen.

Preparation of Adults

While in the field keep the envelopes containing live dragonflies as cool as possible. Store them in a non-crushable box. Tupperware boxes of the proper size are excellent for this purpose.

For convenience, specimens are usually kept alive in the envelopes until the collector returns to base. This also allows time for the specimens to empty their digestive tracts; color is usually preserved better in a specimen with an empty gut.

The color pattern of some species, especially some blue ones (e.g. *Aeshna's, Argia's* & *Enallagma's*) fades soon after capture. This fading can often be reversed by exposing the specimen to sunlight. However, if possible, such species should be treated in acetone immediately.

Acetone treatment: Acetone dehydrates the specimen and dissolves fat, reducing the decomposition of color pigments. Acetone is flammable; use caution. Avoid breathing the fumes and absorbing the liquid through your skin. Acetone can be purchased at most hardware or paint stores.

Keep the acetone in a wide-mouth plastic or glass jar or other container inert to the solvent. The wider the mouth, the better, but make sure that the lid is leak-proof. Pack the jar(s) in a box for stability.

The dragonfly must be killed and its body arranged in the proper configuration before treating it in acetone, otherwise it may dry with abdomen curled and wings and legs awry. I prefer to do this by dropping the specimen in the acetone outside of the envelope. As soon as the insect is dead, I remove the specimen and position it in the envelope. The abdomen should be straightened (to make measuring it easier) and the legs should be brought forward (so that they do not obscure the base of the abdomen). The envelope containing the dragonfly then is immersed, on edge, in the acetone.

Sometimes you may want to kill dragonflies, especially larger species, by injecting acetone into the thorax and base of abdomen with a hypodermic needle. This introduces the chemical into the muscles and organs faster than simple soaking, and it seems to improve color retention in the larger specimens.

Leave the dragonflies in the acetone for about 8-24 hours depending on size. I unusually process my specimens at night removing them from the acetone the next morning. You may also find it easier to take the envelopes out for drying when the next day's catch is ready to go into the jar(s). The acetone should be replaced after a few batches have been processed, i.e. when it becomes pale yellow (indicating considerable dissolved fat).

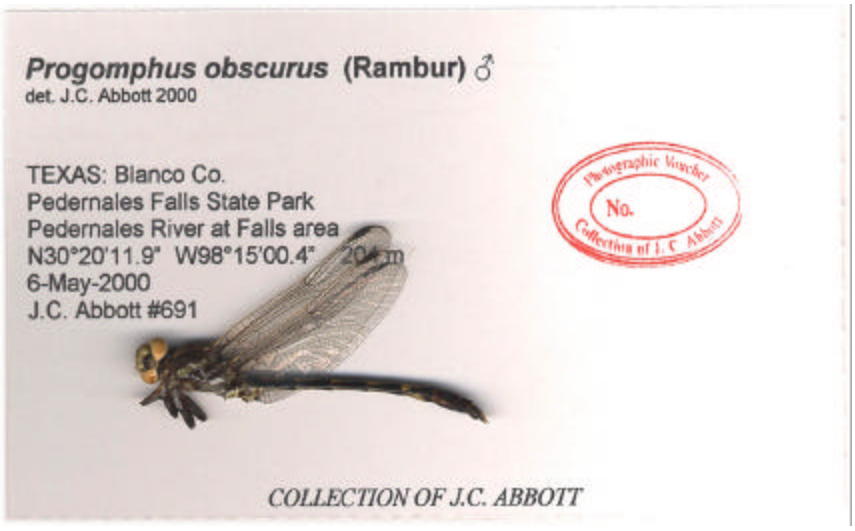
Drain the acetone out of the envelopes back into the jar (this is where snipping a little bit off the bottom corners of the envelopes will facilitate drainage) and dry them and the specimens in them in a well-ventilated place as quickly as possible. This is the critical step. To get the best specimens, they need to be dried as quickly as possible. When possible, I use a dryer like the one in the lab. If I'm in the field I do this outside in the sun and breeze. The faster the drying occurs, the better the color preservation. A desiccant can be used in an enclosed container to help with the drying. I find it best to leave the specimens in the acetone for a longer period, rather than remove them when I have no way of drying them.

When the envelopes are very dry, store them in Tupperware or cardboard boxes that will withstand crushing. Store the envelopes vertically, like a card file, and DO NOT pack them tightly. At this stage specimens can be squeezed and flattened if jammed too closely together. Tupperware containers are good because their tight seal prevents most pests from attacking your specimens. In humid climates, the inclusion of silica gel desiccating packets helps keep the specimens dry.

If using acetone is impossible, simply dry the specimens as rapidly as possible after they have been killed. Placing the boxes containing specimen envelopes at close range over or under electric lights is helpful. Or put them on the dashboard of your car in the sun. The faster the drying occurs, the better the color preservation. In the tropics, acetone is invaluable, since air-drying specimens is difficult and specimen damage is common. Acetoned dragonflies may even resist damage by pests (ants, carpet beetles, psocids, mice) more than untreated ones.

Permanent Storage

Once the specimens arrive at a museum or other collection, they are taken out of the glassine envelopes and stored permanently in clear envelopes made of cellophane, mylar or polypropylene. The identification and collection data are typed on 3" x 5" cards, which are inserted in the envelopes behind the specimen. The envelopes are then stored like a card file in cabinets or plastic shoeboxes. Here is an example of a properly preserved and curated dragonfly.



Modified from R. Cannings
Rev. J.C. Abbott, 8/26/2000.