



COLLECTION PROTOCOLS: BAT REMAINS, SKULLS, GUANO

All bat remains are delicate, but particularly older skulls (no flesh, fur, fat globules or mold on remains) and should be handled with extreme care.

Contact BatCaver or check the website for a research facility to send remains and guano to.

PLEASE NOTE: Collection of anything requires permitting from your provincial government agency, with the exception of guano. Contact BatCaver for more info.



Recent bat remains (2-10 years since death)



Mouse skulls, for reference

COLLECTION MATERIALS

- rubber gloves if possible
- ziploc baggy to contain remains
- Q tip or other disposable stick
- plastic bag to contain waste items for later disposal (rubber gloves, Q tip)
- hard container that is just big enough to contain the remains in baggy without damage
- Small marker, to write on baggy or container

Once removed from the cave, the specimen should be kept sealed and cool until transferred to a facility for study. Label the container with cave name, location (coordinates are useful), type of specimen (carcass, skull, guano), collector and date. If the container is too small for this info, put it into another baggy or container with this info written on it.

IDENTIFICATION

It is a common mistake to confuse bat remains with rodent, especially when they are scattered across the floor, which is more common than the articulated remains seen above, which measures about 6cm across in total. Wing bones are extremely thin and can be thinner than toothpicks, while the skull is only about 1.5cm long. Bat skulls typically have teeth along each side of the jaw with a gap in the teeth at the snout and in profile often have a 'saddle' shape. Rodent skulls are generally more common and have large incisors at the snout with a gap separating them from the molars.

BAT CARCASSES

Recent bat remains should never be handled directly due to the risk of infection or transmission of disease. The remains can be carefully picked up using rubber gloves, or with a baggy, by inverting the baggy and using it as a 'glove' to pick up the remains (be careful, they are very delicate) and then pulling the sides up around the remains and sealing the baggy while gently removing excess air. Roll the excess baggy up around it and transfer into a hard container. If there is extra space in the container, add other material to prevent it moving around – another baggy or paper from a notebook if necessary.

BAT SKULLS

This category of remains is skeletal only, ie. no flesh on the remains as seen below. In this case, no special precautions are needed except to avoid damage to the skull. Bat skulls are extremely delicate and can be crushed by direct handling: DO NOT pick up. If they are embedded in sediment, the sediment should be pried up, not the skull itself. A pencil tip works nicely for this. A complete, uncrushed skull is necessary for identification; lower jaws are helpful but are often not recovered. The skull must be gently pushed into a baggy or portion thereof, rolled lightly in the plastic and placed in a small hard container so that it can not move. Again, pushing too much plastic into the container will crush the skull so just enough plastic to completely surround the skull and fill the container is enough.



Skulls of two of the most common cave bats in BC.

*Left: Little Brown Bat, *Myotis lucifugus*; Right: bottom view of Townsend's Big-Eared Bat, *Corynorhinus townsendii*. Note the gap between the teeth at the snout, a common identifier for BC bat skulls as opposed to rodent skulls.*

GUANO

Collection of bat guano can tell us much about what the bats are eating. Identifying bat guano from mouse can be difficult, but as a rule of thumb, the further into the cave you go, the less likely it will be mouse guano, unless the cave is still close to the surface or other entrances. Bat guano in Canada tends to be sporadic and rarely accumulates in piles as seen in tropical caves. An individual pellet, if not disturbed by water, tends to be the shape of a grain of rice but slightly smaller. Pellets larger than this size are usually from a rodent such as a woodrat. It rarely molds and appears individually and in clusters. If there are tufts at each end of the pellet, it is not bat guano. You can scoop it up with the edge of a baggy and then roll it up around it. Try not to crush it and put the baggy into a hard container. Follow the labelling protocols listed above.

Typical bat guano from a cave in western Canada

