Ridding Ectoparasites and Flea Collection Techniques

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I know that shrews are extremely sensitive to excitement and environmental changes and the following may or may not be an appropriate treatment to "de-flea" the animals prior to containment/observation/captivity. The procedure may be used for other animals as well.

Place animals in a hardware cloth enclosure and suspend a foot or more over a bucket or other suitable container for capturing the fleas. After 24 hours the fleas should vacate the host. This process may be accelerated (to only a few (seconds) by blowing a gentle stream of CO_2 over the animal (while enclosed in the hardware cloth cage, or while holding the animal). The CO_2 will stimulate most flea species to become agitated and cause them to evacuate their host's pelage without harm to the host. Avoid concentrating the stream of CO_2 in the face of the animal as it will also irritate the animal's respiratory system.

In addition, the following procedures for collecting and recording data for fleas from small mammalian hosts have proved very effective when the purpose is to collect fleas for systematic/molecular studies.

Flea Collection Techniques

For small rodents, i.e., Peromyscus, Neotoma, Apodemus, etc. small collapsible aluminum Sherman traps (3 x 3 x 10 inch) work well using oatmeal for bait. Baits such as seeds, fruits, tubers, etc, may be used in different localities to match the natural food source of the animals being trapped. For nocturnal animals, traps are picked up right after first light and for diurnal animals about 10:00-11:00 A.M. (to avoid heat problems). White cloth bags (approximately 9 x 12 inches) sewn from an old cut up sheet work well to contain small animals. White enables one to see the fleas that WILL be in the bags. As I check my trap lines, I place the bag directly over the end of the trap, while pushing the door open, shake the rodent into the bag. This gets fleas that might be in the trap as well as those remaining on the animals. The sack is tied closed with a string and the rodent is immediately sacrificed by crushing the heart/lung area between the thumb and fingers. This is quick, bloodless, and does no damage to the skull or study skin for later museum preparation. The animals will quickly chew out of the bags if not sacrificed. Then I proceed to the next trap. Once finished, the animals are processes in the field or in the lab (depending on locality). If you catch and release the animals, it is best to leave the animals in the traps while transporting to an area to process them for fleas to preclude them chewing out of the cloth bags.

To process the mammals (small), the white bag and all contents are poured into a five-gallon bucket (clean and white). The bag should be held down in the bucket while turning it inside out. Examine the surface for fleas, which can be flicked of into the bucket. Animals are picked up and held down in the bucket while running a gentle stream of compressed CO_2 over the fur for about 15 seconds. The CO_2 passes through 1/2 rubber tubing to a tip (1/2 inch copper pipe flared our by hammering one end relatively flat). The flanged tip delivers a broadly distributed stream of CO_2 as you run it over the fur (as using a vacuum...except blowing a stream of CO_2). Most fleas will be agitated by the CO2 and jump off into the white bucket. Some are less sensitive to CO_2 and must be "combed" out. To comb the rodent, I use an old toothbrush with all the rows of bristles cut off flush with a razor blade, except for two rows. Pay particular attention to combing the neck and head area and the rump area over and around the tail. Frisk them good and briskly. Fleas are highly adapted to hang on and crawl deep in the fur. Rodents are often unable to preen the nap of the neck and over the tail, so fleas tend to congregate in these areas.

Once satisfied that the animal no longer has any remaining fleas, it is placed in a bag for mammal processing. I usually examine fleas as I collect them, but that is because I can't wait to see them. Therefore, I place a dish of alcohol (syracuse dish) in the bottom of the bucket and using an applicator stick sharpened to a fine point, pick up the fleas by dipping the stick into the alcohol, and gently touching the flea that adheres to the wet stick. Each flea is transferred to the syracuse dish. If you are not interested in examining the flea, use a vial instead of the syracuse dish. After fleas are examined with a dissecting microscope, they are placed in a vial (all the fleas from ONE animal in ONE vial). A duplicate field number is placed in both the host animal bag and INSIDE the alcohol vial of fleas to associate the parasites with the voucher host specimen.

The data associated with each field number should include (as an example):
Host animal species: *Peromyscus yucatanensis*
Sex of host animal: Male/Female
Developmental stage: Juvenile/Adult
Locality: 2 km NE of Merida, Yucatan, Mexico (coordinates if possible)
Date of collection: Day/Month/Year 3 Mar 1998 (always write month out)
Collector: MW Hastriter

Habitat data such as terrain features, i.e.; boulders, sand, etc. and vegetation types are valuable to associate with host and parasite relationships. Mammal measurements might also be recorded. Ultimately, recording data into a computerized format, i.e., Excel, makes record keeping much easier and is essential for large collections in order to manage all the data. Other ectoparasites might also be collected and stored in the same vials for later sorting and distribution to specialists, i.e., ticks, mites, bat flies, etc.

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