

**GENERAL EXTERNAL FEATURES****INSTRUCTION**

*Obtain a mink from your instructor. Position your mink on its side in a dissecting pan so that you may observe the external features of your mink.*

The mink (*Mustela vison*) has a long slender body, long bushy tail, short legs and sharp, powerful teeth. These characteristics allow minks to be extremely agile runners, excellent swimmers and efficient hunters. Minks den in small family groups along streams and lakes and their diet typically consists of small mammals, birds, eggs, frogs, crayfish and fish. Like most mammals, the body of the mink is divided into the **head, trunk and tail regions** (Figure 1.1). The trunk is further divided into the **thorax and abdomen** (which are separated internally by the diaphragm). The thorax houses the heart and lungs, while the abdominal region houses the major digestive, excretory and reproductive organs. Notice the sensory organs concentrated around the head. There are **eyes, ears (missing), nares (nose) and vibrissae** (whiskers - missing). These organs all play a collective role in the mink's ability to sense and respond to stimuli in its environment. Minks are primarily nocturnal, venturing out under the cover of darkness in search of their prey. As a result, their eyes are adapted for excellent night vision and contain a specialized, reflective layer on the retina, the tapetum lucidum, which maximizes the amount of visible light that their photoreceptors can absorb. The tapetum lucidum is also responsible for the yellowish-green eyeshine that is characteristic of minks and other nocturnal mammals. The external coverings of the mink eye consist of upper and lower eyelids and a nictitating membrane that moves laterally from the medial corner of the eye. The vibrissae (commonly called whiskers) that are used for tactile sensations will most likely be missing on your specimen. The base of each vibrissa is attached to a sensory nerve, which is triggered by pressure or contact to the whisker. Other vibrissae are located over the eyes and on the cheeks and chin.

**INSTRUCTION**

*Lay your mink on its dorsal side, so that you may view the structures on its ventral surface.*

The minks used for dissection purposes are typically obtained from commercial mink ranches and sold for their fur; thus they are already skinned. They are usually also missing the distal portions of the **forelimbs and hindlimbs**, as these regions are removed during the skinning process. Another caveat concerning the mink is that commercial dealers keep most of the females for breeding purposes. As a result, you may find that the majority of specimens in your class are males. Because of the potential for reduced opportunity to view females, we have provided more photographs of females to compensate. Each front forelimb terminates in a **manus (forefoot)**, and at the distal end of each hindlimb is a **pes (hindfoot)**. Both forefeet and hind-feet are equipped with sharp **claws**, derived from keratinized epidermal

tissue. Because of the orientation of the fore- and hindlimbs, minks (like humans) have a posture known as **plantigrade**, in which the heel and the digits of each foot rest on the ground. Cats and other mammals display a type of posture known as **digitigrade**, in which the heel of each foot is elevated above the ground. They are, essentially, walking or running on the tips of their “fingers” and “toes.”

You should be able to determine the sex of your mink using external features. As a general rule, males are typically larger than females. While both sexes have many of the same structures, some of their locations differ in males and females. Both sexes have 8 **mammae** on the ventral surface of the abdomen. In females, these mammae are the external openings for the mammary glands, which store and secrete milk during lactation for the newborn young. The nipple of the “mammary gland” is actually an accumulation of small ducts leading from alveolar glands embedded in the adipose (fat) tissue of the thorax. Females usually give birth to 2–6 young at a time, although litter sizes of up to 10 are possible, and these young depend on milk secretions from the mother for nourishment until they are old enough to forage on their own. While males do possess mammae, they do not provide any known function. (NOTE: The mammae may be damaged or absent, and therefore difficult to locate, on your specimen due to the skinning process.) Both males and females possess an **anus**, located just ventral to the base of the tail (Figure 1.1). It is through the anus that undigested foodstuffs are eliminated (or egested) from the body. Typically, the term excretion is reserved for references to the elimination of metabolic waste products (e.g., nitrogenous wastes) from the body, while the term egestion applies to the elimination of indigestible material that the body cannot break down. A feature common to members of the Mustelidae is the presence of **anal sacs** (or glands). These structures produce a foul-smelling compound that gives weasels, ferrets, skunks, minks and otters their “characteristic” odor. (If you’ve ever kept a ferret as a pet, you know what I mean.) In fact, in many ferrets that are kept as pets, these glands are surgically removed to make the animals more esthetically appealing to their owners. In nature, however, these glands do serve an important purpose. Derived from modified apocrine glands, anal sacs discharge their products into the anal region, making the pheromones a component of the feces. These secretions are important in marking trails, establishing territories, courtship behavior, defense, and in recognizing individuals within a population.

## **INSTRUCTION**

*Before proceeding, remove the anal sacs (if present) from your specimen. These structures are often removed during commercial preparation of these animals. If so, some musculature may have been damaged as a result of “hasty” removal of these structures. BE EXTREMELY CAREFUL with this procedure and consult your lab instructor for assistance. DO NOT PUNCTURE OR BREAK OPEN THESE ORGANS.*

### FEMALE EXTERNAL FEATURES

Females have an external **vestibule (or vaginal vestibule)** ventral to the anus, near the base of the tail (Figure 1.1B). This region represents the opening to the reproductive pathway and serves as a channel for the release of excretory products (urine) from the body. The vestibule is the terminal portion of a long, tubular passage from the urogenital sinus in the mink, but it is a shallow depression in some mammals, including humans, that is flanked by lip-like folds of skin. These folds of skin are homologous to the labia in human females. A (very) small **clitoris** may be visible resting in a shallow depression along the mid-ventral line of the urogenital sinus. As a homologue to the male penis, this structure plays a similar role in sexual sensation and sends information about sexual stimulation to the brain. The entire region consisting of the labia, clitoris and vestibule are collectively referred to as the vulva.

### MALE EXTERNAL FEATURES

In males, the urogenital opening is located at the distal end of the **penis** (Figure 1.1A). This represents the opening of the urethra which releases excretory products (urine) and semen in the adult. **Scrotal sacs** are present near the anus. (NOTE: one or both of the scrotal sacs and enclosed testes may be missing on your specimen due to the skinning process. If so, view another male mink with intact testes, or refer to the photographs to locate these structures.) During embryonic development, the **testes**, which originally form deep inside the abdominal cavity near the kidneys, migrate caudally and eventually descend into the scrotal sacs. Since sperm production is highly sensitive to temperature, the testes of most mammals are housed outside the body where temperatures are cooler than in the abdominal cavity. In humans, the temperature inside the testes is about 2 °C cooler than the temperature within the abdominal cavity. If environmental temperatures drop too low, a special set of muscles known as cremaster muscles retracts the testes, pulling them closer to the body to conserve heat. In many mammals, the testes only descend during breeding seasons. A unique feature of the mink penis is the presence of an **os penis** (or baculum). The os penis is an ossified structure that assists in maintaining an erection during copulation and allows the male to insert the penis fully into the long vaginal canal of the female. Humans lack such a bone. Another interesting feature of the penis in the mink is its size. The penis is quite long relative to the rest of the mink's body. This property enables the penis to fit completely through the tube-like vestibule and urogenital sinus of the female and deposit sperm directly at the bifurcation of the uterine horns — thus providing the sperm with a significantly shorter distance to swim to reach the eggs. Such “perfectly matched” features have coevolved in concert through millions of years of natural selection operating on the individual variation in these traits that naturally exists in populations of animals.

