

## Crickets

### **Background:**

Of the several kinds of crickets that live in North America, the black field cricket is the most familiar. It lives in grassy fields, vacant lots, gardens, roadsides and lawns. Another, the house cricket (sometimes called the gray cricket) is brown in color and live in similar places, but it is somewhat less common. Except for the difference in color and the house cricket's slightly longer wings, these two are similar in appearance. A third kind, the cave or camel cricket (which is actually not a true cricket), resembles the other two but has a distinct hump on its back. The cave cricket favors cool, moist, dark places and is generally found under rocks and logs

Crickets live in cracks in the ground, in small chambers they dig in the soil or under objects such as rocks or boards. Their food is mostly green plant material or some plant derivative such as fruit or seeds. They need some moisture but usually obtain enough from their food. Because they prefer warm temperatures, they are most active during late summer and early fall; and being primarily nocturnal, they are more often heard than seen.

The chirp of a cricket is an insect equivalent of a birdcall: its primary purpose is to attract a mate or mark the cricket's territory. Only the male's call, and the sound are made by rubbing their wings together (not the hind legs as sometimes thought). The front wings have rough rasp like surfaces that when rubbed rapidly together produce the chirping sound. Crickets perceive this sound and others with "ears" located on the side of their front legs. (The ears consist of membranes that function like an eardrum to sense vibrations.)

Since the cricket is an ectothermic or cold-blooded organism, its metabolism, and its rate of calling, is affected by the ambient temperature. As a result, one can make a rough approximation of the temperature in degrees Fahrenheit by counting the number of chirps every 15 seconds and adding 40. To calculate the temperature in degrees Celsius, one would divide the number of chirps in 1 minute by 7 and add 4. Crickets are trying to change from English to metric, but they are presently operating under both systems.)

### **Characteristics:**

Crickets show the typical insect attributes. They have three body parts: head, thorax and abdomen. The head is equipped with eyes and antennae for sensing the environment and a mouth. Two pairs of wings and three pairs of legs are attached to the thorax. The abdomen contains the reproductive organs and most of the digestive system. A row of small holes on the thorax and abdomen called *spiracles* are openings to the respiratory system. All crickets have two projections about one-half the length of the body extending rearward from the abdomen. These are called *cerci* (singular *circus*) and are used to detect vibrations. Females have a third, longer projection called the *ovipositor* between the cerci.

### **Reproduction:**

After mating the female pushes her ovipositor into the soil and releases a single egg: this process may be repeated over 2000 times in her brief lifetime. Crickets exhibit gradual (incomplete) metamorphosis. Each egg hatches into a tiny nymph, which only superficially resembles an adult in appearance. The nymph molts several times, each time becoming more like an adult in appearance. With the final molt, the cricket becomes fully developed and sexually mature. The entire life cycle requires from two to four months depending on the temperature. Warmer temperatures speed the process.

Most adult crickets do not survive the winter, so the size of the summertime population is largely a function of the eggs that over-wintered in the soil. The population reaches its peak in autumn as more and more crickets hatch. Since, the length of the average life cycle is temperature dependent, the higher the average summer temperature, the larger the cricket population.

## **Crickets (cont)**

In nature, crickets are preyed on by many animals, including birds, toads, and insect-eating snakes. Human beings have also learned to use crickets for a variety of purposes. In China and Japan, crickets are sometimes kept as house pets for the pleasure of hearing their song. They are excellent fish bait and pet food for lizards and larger aquarium fish. Crickets are also widely used in schools to study ecology, animal behavior, physiology and entomology. House crickets are usually used for these purposes, as they are easier to raise in captivity than field crickets.

### **Crickets in the Classroom:**

Crickets are easy to keep in the classroom-if one is prepared to tolerate a little chirping. Their needs are simple, and they can be kept in two ways, depending on the outcome desired. If the goal is to keep the crickets for a short time, a covered jar is satisfactory. A breeding colony, however, requires more space and a little additional care. Either case, field crickets or house crickets can be used, but house crickets are superior for rearing and breeding.

### **How to Obtain:**

Live crickets can either be collected from their environment or purchased from a local fish bait dealer or pet shop. Or they can be ordered from a biological supply company.

### **Caring for Crickets**

#### **Housing:**

To keep crickets a few days, place 1 to 2 inches of sand or soil in a jar with a ventilated cover. Add a dry leaf or a crumpled paper towel and the enclosure is complete. The soil will provide a medium in which the cricket can dig, and the leaf will give it a surface on which it can climb and a place to hide.

#### **Diet:**

Crickets will eat a variety of foods, but a slice of apple, carrot, potato or celery or a piece of lettuce is a good-short term food, as it will also provide the crickets with the moisture they need. The food should be replaced every day or two so it will not decay or mold.

Assuming that they are given sufficient food and an appropriate environment, crickets can go unattended over weekends.

#### **A Breeding Colony**

A breeding colony of crickets can be kept in much the same way, except that a larger container is needed and two seemingly inconsistent requirements have to be met. First, the environment must be kept dry to prevent disease. And, second the crickets must have moist soil or sand in which to lay their eggs.

Meeting these two requirements is the real secret of raising crickets.

A standard aquarium is an excellent container for housing a breeding colony. The crickets cannot climb the smooth glass walls and the sides are tall enough to prevent them from jumping out-but a screen is recommended. Place 1-2 inches of dry sand or soil in the aquarium. Also, add a shallow dish of moist sand or soil (a plastic margarine tub is perfect) for egg laying. Crumpled paper towels will provide a hiding place and a surface for climbing, but empty egg cartons with a few holes punched in them are even better. If the cartons are put into the aquarium open side down, the crickets will climb inside and out.

### Crickets (cont)

Crickets will consume almost anything including, each other if they run out of food. Dry dog food is a well-balanced diet and is easy to provide, but crickets can also be well nourished on oatmeal, cornflakes, bran or any other grain cereal. Any dry food however should be supplemented occasionally with leafy or succulent vegetables. Water should be available continuously, but crickets will fall into an open container and drown. The best way to provide water is to invert a small jar or vial of water in a shallow dish with a few thicknesses of paper towel between the jar and the dish. The crickets will be able to get their water from the moist towels.

A small colony of 20-40 females can lay several eggs each day, and these can be collected in a shallow dish of moist sand or soil (a plastic margarine tub is perfect). The dish should be slightly recessed in the sand so the crickets can climb in. Adult crickets will eat some of the eggs (and will also cannibalize newly hatched young), so the dish should be removed after a few days and replaced with a fresh one if more eggs are to be collected. Put the dish with the eggs in another escape proof container (a small aquarium or plastic shoebox) for incubation and hatching. It is essential that the eggs not dehydrate. This can be prevented by lightly sprinkling the soil with water as needed to keep it slightly moist. The eggs will hatch in three to four weeks depending on the temperature. (Cooler temperatures will prolong the hatching time). The tiny nymphs will come to the surface of the soil and out of the dish. At this time they can be fed, watered and cared for just as the adults are. After about three weeks they can be kept with the adults with less risk of their being eaten.

Cricket will survive at room temperature, but they will be considerably more active and reproduce better at temperatures 80°-85° F is about right. A light bulb in the cage is a good heat source. Keep the cage clean. Remove accumulated droppings, any dead crickets and uneaten food. And, remember to keep the colony dry.

#### **Observation, Activities and Questions:**

- Observe and describe a cricket. Find the three body parts. How many legs does a cricket have? How many antennae? How many abdominal projections? Is this cricket a male or a female?
- How does a cricket move? Jump? Walk?
- Observe and describe a cricket when it chirps. Do all crickets chirp?
- Try to determine the temperature by counting a cricket's chirps. For degrees Fahrenheit, count the number of chirps per 15 seconds and add 40. For degrees Celsius, divide the number of chirps in one minute by 7 and add 4.
- Observe and describe a cricket laying eggs
- Observe and describe baby crickets. How do crickets change as they grow?