



By LARRY WEBER
Illustrations by TAINA LITWAK

buggy sounds of summer

Biking to a park on a hot July day, you hear clicking and buzzing coming from roadside grasses. Returning at dusk, you tune into chirping and creaking too. In the days and weeks that follow, more buzzing and whining calls resound from treetops. Welcome to the hot sounds of the singing bugs of summer.

Crickets, katydids, and cicadas perform in this warm-weather chorus. The males call for mates.

Instead of using throats and lungs to sing, these insects make sounds using other specialized parts on the skeleton on the outside of the body.

Because they are cold blooded, insects need hot days to warm up their instruments. You won't hear them on a cool morning. But if you listen, you will notice them around midday. By late afternoon or early evening, more insects will have joined the chorus.

CICADA, TIBICENS SP.

Crickets and Katydid

Crickets and katydids belong to the insect order Orthoptera, which means “straight wings.” Though many do have straight wings, some have rounded or curved wings.

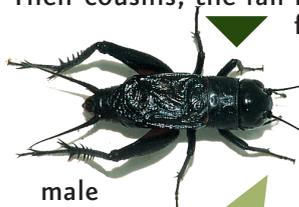
Crickets and katydids make sounds with their wings. The insect rubs a sharp ridge on one wing against a rough part of the

other. As it rubs, its wings vibrate. The vibration amplifies the sound. This singing style, known as *stridulation*, sounds like buzzes, chips, chirps, or clicks.

Crickets. Crickets hold their wings flat on the back. Their long, slender antennae extend beyond the body. The female has a single long tube, called an *ovipositor*, for laying her eggs in soil or plants.

Larry Weber is a science teacher at The Marshall School in Duluth.

Two common kinds of field crickets sing chirping songs in Minnesota. Listen for spring field crickets from May to July. Their cousins, the fall field crickets, sing from July to October.



male



female

We've been kept as pets in Greece, China, and other places for 2,500 years, mostly for the male's sweet singing and tough fighting.

brreeet-brreet-brreet
brreeet-brreet-brreet
brreeet-brreet
brreeet-brreet-brreet

Ground crickets make a series of soft, high-pitched trills or buzzes. Their pulsating call often seems like background noise, resounding day and night from late summer into October. Ground crickets are dark brown and often striped. You might see these tiny crickets scatter in front of a lawn mower.



THOMAS J. WALKER

MALE AND FEMALE FIELD CRICKETS BY LARRY WEBER



Tree crickets are pale green with broad wings. Some species live in trees and bushes, especially raspberry and blackberry, and tend to sing at night. Some tree crickets live in grasses and

Use me, the snowy tree cricket, to tell the temperature: Count the number of chirps in 13 seconds, then add 40 to estimate the degrees Fahrenheit.

weeds, and call both day and night. Though some chirp, most make a very long trill: *treet-treet-treet*. When they synchronize their calls into one loud sound, it seems to come from everywhere at once.

Katydid. Katydid look like large green grasshoppers with super-long antennae. Indeed, another name for these insects is long-horned grasshoppers.

Minnesota is home to four kinds of native katydids: bush katydids, meadow katydids (also

called meadow grasshoppers), conehead katydids, and shieldback katydids (also called shieldback grasshoppers). They live in the vegetation and feed on leaves. A few will eat other insects. Katydid start calling in mid-July and keep going until October.



Meadow katydids are the next to call. All afternoon and into the evening on hot days, you can hear their *click, click, click* followed by louder buzzes.

Shieldback katydids, the first to call in summer, buzz softly for two to five seconds at a time.



tch-tch
tchtchtchrrrtch
tch-tch
tchtchtchrrrtch

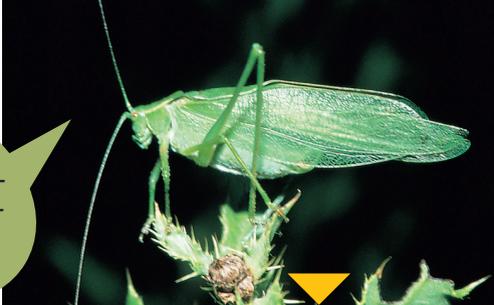
PHOTOGRAPHS BY LARRY WEBER



More katydids

zeep-zeep-
zeep-zeep-zeep-
zeep-zeep-zeep-
zeep-zeep

tsip-tsip-
tsip-tsip-tsip-
tsip-tsip-
tsip-tsip



Bush katydids, camouflaged on leaves of shrubs and meadow grasses, call in late afternoon. Their sharp zick call sounds like crunching a potato chip. After dark, the males make a creaking *zeep-zeep-zeep* song that females sometimes answer with a little *chip*.

Conehead katydids

call from fields and roadsides of grasses and sedges on warm summer nights. Males repeat a loud, quick *tsip-tsip-tsip* or a loud, steady buzz.

The name *katydid*

comes from a large species found in the southern and northeastern United States. Pioneers thought the katydid call sounded like "Katy-did" or "Katy-she-did," and so they dubbed the noisemaker the katydid. This species is not native to Minnesota, but it was accidentally transported here years ago and can now be found in the Twin Cities area.

Katydid and crickets have ears on their front legs. Now put me down!



katydid ear

PHOTOGRAPHS BY LARRY WEBER

Cricket wings

Big sound, little size

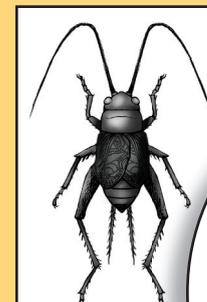
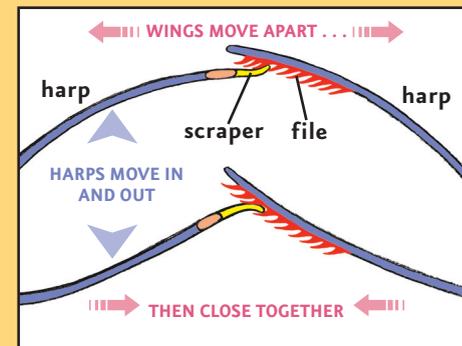
We male crickets have very special wings. Not only do we use our wings to fly, but we also use them to make sounds.

Our secret? Close to the place where our wings meet, we have a *file* and *scraper*. The tiny row of teeth called a file hides beneath the top wing. The bottom wing has the scraper. The scraper edge curves to fit between the teeth.

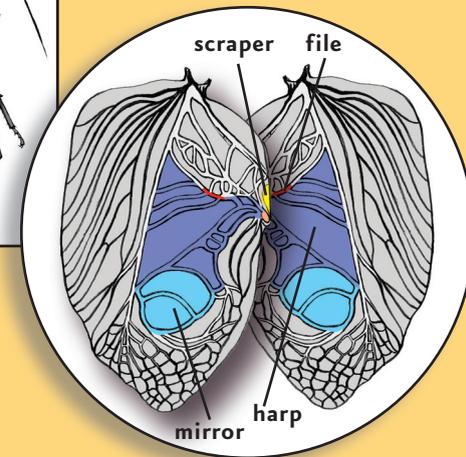
When we close our wings, the scraper trips across each tooth and makes a tiny pulse of sound. Back and forth the cricket's scraper moves, a little bit like the way you might scrape your fingernail across the teeth of a comb, only much, much faster. (Common field crickets play 4,000 teeth per second.) The male katydid uses only one wing as a scraper and one as a file, and he makes sounds only when closing his wings.

This little sound grows louder as it bounces through the broadcasting parts of our wings, called the *harp* and *mirror* in crickets, and into the air.

Future mates can find us easily by just following our songs. Unfortunately, predators can hear us too.



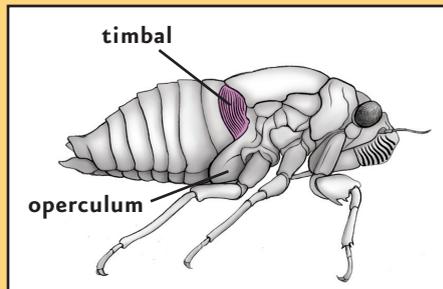
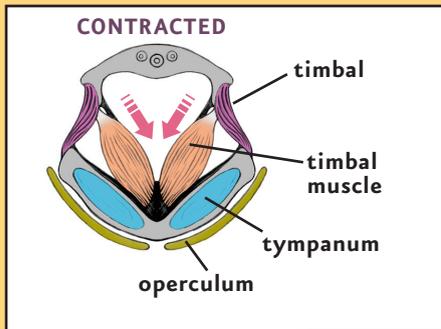
cricket wings closeup



Susan Binkley

Loudest of all

cicada cross section



time, each little rib on the timbal makes a quick sound. When we relax these muscles, the timbals pop out and in many times very fast. Sounds from each rib run together and make a buzz.

Scientists think our expanded abdomen changes the pitch and makes the sound louder,

but we haven't given up this secret yet.

On the underside, we have two *tympana*. We use them like amplifiers to make our sound go far. To do this, we have to open our *opercula*, flaps that cover and protect our *tympana*.

Females don't have timbals, but they do have *tympana*. They use them to hear our mating calls.

We may be small, but we have a really cool way to make awesome, loud sounds.

Susan Binkley

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If only summer would last longer!



Male cicadas are loud! One of us is the loudest insect in the world. He's an African cicada recorded at 106.7 decibels (as loud as a chain saw) at 1 meter.

Our noisy song starts in stiff but flexible ribs found in parts called *timbals*. Only males have a pair of timbals: one on each side, under our wings.

When we want to attract a female, we lower our abdomen and puff it out. Then we use our *timbal muscles* to pull in our timbals. The timbals buckle like a squeezed pop can. One at a



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