

LIVING

Insects’ summer symphony

We tend to tune it out, but katydids, cicadas etc. produce pleasing hum of sound

From the middle of summer until the first frosts, wetlands, roadsides, fields and even suburban backyards reverberate with the incessant calls of insects. Their singing is so ubiquitous that we tune it out as our brains quickly relegate these familiar sounds to the status of background noise.

What a shame that we almost never take the time to truly appreciate this remarkable wall of sound. Not only are the songs themselves beautiful, but so are the musicians making them. It is always a pleasure to imagine in the mind’s eye all of the various singers



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OUR CHANGING SEASONS

involved – some hidden in the long grass and others high in the trees – pouring out their sonorous message of desire to the opposite sex. The pleasure is greatly enhanced by being able to actually identify the species calling, understand the purpose of the calls and know how they are produced.

The vast majority of insects that use sound as a means of attracting a mate belong to the order Orthoptera, which includes crickets, long-horned grasshoppers (katydids) and short-horned grasshoppers (locusts.) The other main group are the cicadas. As with birds, frogs and toads, only the males call. The females, for the most part, remain silent. Unlike birds, however, insect calls do not have a recognizable melody. They are typically composed of identical sounds repeated at regular intervals. However, because singing insects are cold-blooded, the pulse rate of their songs varies with the temperature, tending to speed up as the temperature rises. As we will see, the song of at least one local species can actually be used to estimate the temperature.

NATURAL VIOLINISTS

Most insects use stridulation to produce their song. In much the same manner as a violin string being “scraped” by a bow, one body part is rubbed against another. In the case of long-horned grasshoppers and crickets, the insects elevate their forewings and then rub them rapidly together. The base of one wing has a hardened edge while the base of the other has a toothed area. Each time the hardened edge hits a tooth, a click is produced. Because the rubbing occurs so fast, the individual clicks blend together and sound like chirps (a short burst of notes) or trills (a continuous train of notes usually lasting several seconds or more.)

As for short-horned grasshoppers (some species of which are completely silent), one of the hind legs is rubbed over a projecting vein, or scraper, on the forewing. Each hind leg has a row of about 80 fine spines that vibrate like the teeth of a comb. In some species, the songs are so high-pitched that they are nearly inaudible, especially if the listener has high-frequency hearing loss. One group of short-horned grasshoppers known as band-wingeds have opted for “crepitation” to get the female’s attention. By snapping their banded hind wings together in flight, they are able to produce surprisingly



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loud crackling sounds.

The shrill, high-pitched drone of the cicada is produced in an entirely different manner. Cicadas have special sound-producing organs called tymbals. They are similar in shape to tiny drumheads and are located on the sides of the abdomen. By contracting abdominal muscles, a click is produced as the tymbals buckle inwards and a second click when they return to their original position. A large air sac in the abdomen – akin to the interior of a bass drum – amplifies the sound all the more. Because cicada sounds are so loud and penetrating, they are sometimes compared to the whine of an electric saw.

EARDRUMS, BUT NO EARS

If insects sing, they must also be able to hear. All of the singing insects possess oval eardrums (tympana). In crickets and katydids, the tympana are located on the forelegs. On locusts, they are on the first abdominal segment. Cicadas, too, have eardrums located on their abdomen. The tympana are very sensitive to changes in the intensity of the sounds.

As for the daily patterns of singing, field and ground crickets can be heard at all times during the day and night. Cicadas and short-horned grasshoppers, however, advertise their presence only during the day and early evening, while tree crickets and most long-horned grasshoppers sing primarily at night. Night-singing insects do most of their calling in the first few hours after darkness falls.

In our yards and gardens, crickets are usually the most numerous insect songsters. The best known members of this group are the field crickets (Gryllidae). They are black, about two centimetres in length and produce a rich, two-note “trrit-tritt-tritt...” However, most of the cricket song we hear actually comes from much smaller insects known as ground crickets (Nemobiinae). Less than one centimetre in length, they create a non-stop wall of sound both day and night. Their song is a rapid but soft series of very high notes, often described as “tikitikiti...”

Cicadas, too, are common most everywhere. They do their singing from tree trunks and branches, often high overhead. Because cicadas – sometimes called “heat bugs” – often sing loudest during the hot, early afternoon, just when you might be feeling drowsy to begin with, it’s a sound that seems to sap the energy right out of you. An amazing characteristic of cicadas is the number of years they spend in the ground as nymphs. Some species, such as the periodical cicadas (Magicicadae) spend up to 17 years underground before emerging as adults. This group does not extend as far north as Ontario, however. The most common cicada in our area is the dog-day cicada, named after the “dog day” heat of summer.

In some parts of suburban Peterborough and in rural areas everywhere, the voices of several species of tree crickets (Oecanthinae) can also be heard. One species of particular interest is the snowy tree cricket. It is pale green in

colour and sings mostly at dusk on warm evenings. Its rhythmic calling is one of the most beautiful night time sounds of late summer. To me, it sounds like a rich, gentle-voiced spring peeper singing a soft, non-stop “treet, treet...” This is the insect that you typically hear calling in the background during campfire scenes in cowboy movies. This species is also known as the thermometer cricket, because it is possible to calculate the air temperature by the frequency of the calls. By counting the number of chirps in eight seconds and then adding five, you can closely estimate the air temperature in degrees Celsius. The warmer the temperature, the faster the insect calls. Snowy tree crickets seem to be relatively common this summer and I usually hear several calling along Roper Dr. in the west end. Along country roadsides, listen for the four-spotted tree cricket. Little more than a centimetre in length, it delivers its continuous, almost non-stop trill both day and night.

LONG-HORNED SINGERS

Long-horned grasshoppers, or katydids (Tettigoniidae), are not as well-known to the general public. They are a less active group, and their green colouration provides excellent camouflage that makes them difficult to see. The term “long-horned” refers to their long antennae. The bush-katydids (Scudderia) are included in this group, and several species are both common and very vocal. They are bright green and can measure two or three centime-

Listen and Learn

Here are some quick descriptions of common insect sounds of the Kawarthas.

Dog-day Cicada: high-pitched, loud, 15 second whine; starts soft, gets louder

Fall field cricket: clear, loud chirps given at one per second

Carolina ground cricket: a soft, rapid, buzzy, single-pitched trill

Snowy tree cricket: soft, rich, evenly-spaced chirps

Four-spotted tree cricket: a fairly loud, continuous trill; like a high-pitched toad

Carolina locust: crackling snaps or clicks as they take flight

Broad-winged bush-katydid: five groups of buzzing notes as it “counts” from about two to nine. Listen for 2-3 notes (pause) 4-5 notes (pause) 5-6 notes (pause), etc.

Marsh meadow grasshopper: a rapid, five second series of soft, raspy “ttrtrech” notes.

tres in length. Many produce a short, electric “teeth of a comb” sound. One species to listen for is the broad-winged bush katydid. It is known as the insect that counts. Each time it sings, it adds an additional buzz or two, almost as if it was counting. See the accompanying fact box on insect sounds for a full description.

One katydid we usually do not find in the Kawarthas is the common or northern true katydid. Its strident call, which consists of three or four very loud, rasping pulses, is a very familiar sound across nearly all of the eastern United States and in parts of extreme southern Ontario. To my knowledge, this species has only been heard hear on a handful of occasions, possibly having inadvertently hitched a ride on some car or truck coming up from the States. With climate change, however, it is very likely that this species will extend its range northwards.

When most of us think of grasshoppers, we think of short-horned grasshoppers, or locusts (Acrididae). Children love to catch Melanoplus femurrubrum, a generally yellow grasshopper with red legs. Surprisingly, these grasshoppers do not produce any audible sound. Another conspicuous species is the Carolina locust. It produces a crackling noise in flight and shows an eye-catching yellowish border on its dark hind wings. At first glance, it can easily be mistaken for a butterfly. Walk along any gravel road or rail-trail in August and you can’t help but see and hear these locusts as they fly up in front of you. Another widespread species is the marsh meadow grasshopper. It inhabits the tall grasses of moist fields and wet meadows. In this species, both the males and females sing in slow, monotonous pulsations.

There are a number of web sites where you can hear insect sounds. One site of particular interest is called Singing Insects of North America by Thomas Walker. YouTube offers great videos of most species as well. Many can be seen producing their calls.

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