

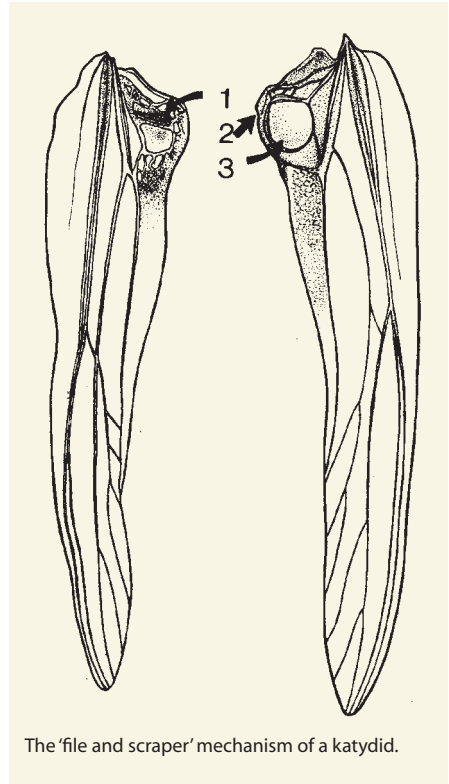
# Sound and hearing

## Katydid song

All Australian katydids produce sounds. No Australian katydid ‘rubs its legs together’, to produce sound as popularly believed. In fact, there are no Orthopterans that produce sound that way. Certain grasshoppers produce sounds by rubbing the legs against the raised veins of adjacent tegmina. The most common method with katydids is stridulation by the ‘file and scraper’ method (see the illustration opposite).

The stridulatory file of the male is located on the underside of the left tegmen (1). The male rubs this file against a raised vein on the right tegmen (2). A simple analogy is the rubbing of a thumbnail across the teeth of a comb. This method is used by males to attract females. There is a vestigial file on the right tegmen that serves no role in stridulation. (Rarely, there are individuals of some species that rub the right wing over the left. Right-over-the-left stridulation is common to crickets). The structure and shape of the tegmen is extremely precise since it produces the sound to which the females respond. The mirror (3) is important as its size and shape helps to determine the way the sound is heard by the recipient.

There are a variety of stridulatory file types in the Australian Tettigoniidae. These range from the simple files seen in the Zaprochilinae to the more standard files of the Listroscelidinae to the highly specialised and complex files of the Tympanophorinae. To see the stridulatory



The ‘file and scraper’ mechanism of a katydid.

file you must be able to see the underside of the tegmen. This involves either spreading the left tegmen or removing it from the insect. The file types illustrated on page 26 have been photographed using the scanning electron microscope.

The shape, length and number of teeth in the file are useful taxonomic tools. The physiology of the male singer determines cadence, pulse rate, etc. Females of most, but not all, species do not have the ability to