Samantha Hall

SOUND PRODUCTION IN A PARASITOID WASP
INSECT STRIDULATION

- Sound production from rubbing parts of the insect body together
- Observed in crickets
VELVET ANT NATURAL HISTORY

- Actually a wasp
- Wingless females, winged males
- Solitary, parasitoid
- Brightly colored hair: aposematic warning
- Stinger
- Stridulation as a warning?
DONALD G. MANLEY

» PREVIOUS WORK
  • Key to the Genera
  • Defense mechanisms & predation
  • Daily activity and temperature
  • Stridulation associated with mating

» Our Primary Question: Which segments of the body are necessary for stridulation and sound production?
METHODS

- Site Profile:
  - Sandhills region
  - Near water source, especially floodplains and drainage basins
  - Near wooded area
  - Evening or early morning

- Finding Specimens
  - Google Earth
3 males and 4 females
*Dasymutilla* sp.

Photograph by: Lyle Buss
**METHODS**

- *Protocol for restricting stridulatory organ*
  - Anesthetized specimen on ice-chilled plate
  - Applied glue to each segment sequentially with hypodermic needle

- *Sound Recordings*
  - Marantz digital recorder & Sennheiser microphones
  - Used Raven 1.2 Software (Cornell University) to analyze sonograms
COMPARISON OF SONOGRAMS FROM RESTRICTED AND UNRESTRICTED SEGMENTS

1. Record sonogram of unrestricted gastor
2. Glue particular tergites to restrict movement of stridulatory organs
   1. Glue sequentially from tergites 6 to 2
   2. Glue sequentially from tergites 2 to 6
   3. Glue segments of interest
3. Record sonogram of restricted gastor
4. Attempt to remove restriction and rerecord sonogram
SONOGRAMS FROM FEMALE D. OCCIDENTALIS

No restriction  Tergites 3-6 restricted  Tergites 2-6 restricted
SONOGRAMS FROM FEMALE *D. OCCIDENTALIS*

- No restriction
- Tergites 2-3 restricted
- Recovery

Frequency (KHz)

↑ Glued

↑ Glue removed
SUMMARY OF RESULTS

- Stridulating organs are observed in all tergites (2-6) of the gastor.

- Physically restricting movement of tergites 3-6 may diminish amplitude of sound, especially at higher frequencies, but not inhibit overall stridulation.

- Physically restricting movement of tergites 2-3 will usually completely block stridulation.

- This phenomenon is seen in two species of velvet ants: *Dasymutilla occidentalis* and *Dasymutilla castor*.
What is the nature of the topography of each segment?
Is there anything anatomically unique about the stridulatory organ in tergites 2-3
Scanning electron microscopy (SEM)
Dorsal Patch T3

File of stridulatory organ

Scraper of stridulatory organ

Lateral region

Patch

Dorsal patch T3
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