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WHISTLING CATERPILLARS: SIZE-DEPENDENT PRODUCTION OF SOUNDS

Shinji Sugiura , Takuma Takanashi, Wataru Kojima, and Zenta Kajiura

Study Description

Some lepidopteran larvae produce sounds to startle or warn predators. Sound production through larval abdominal spiracles (i.e., whistling) has been reported in two closely related moth groups, hawk moths and wild silk moths. However, the sound characteristics and sound-producing spiracles of wild silk moth larvae remain unclear. We experimentally showed that penultimate and especially last instars of the wild silk moth *Rhodinia fugax* produce sounds by forcing air out of the first abdominal spiracles. Sound production is also limited to penultimate and last instars in whistling hawk moths. Therefore, we hypothesized that the evolution of whistling is associated with large body size in lepidopteran larvae.

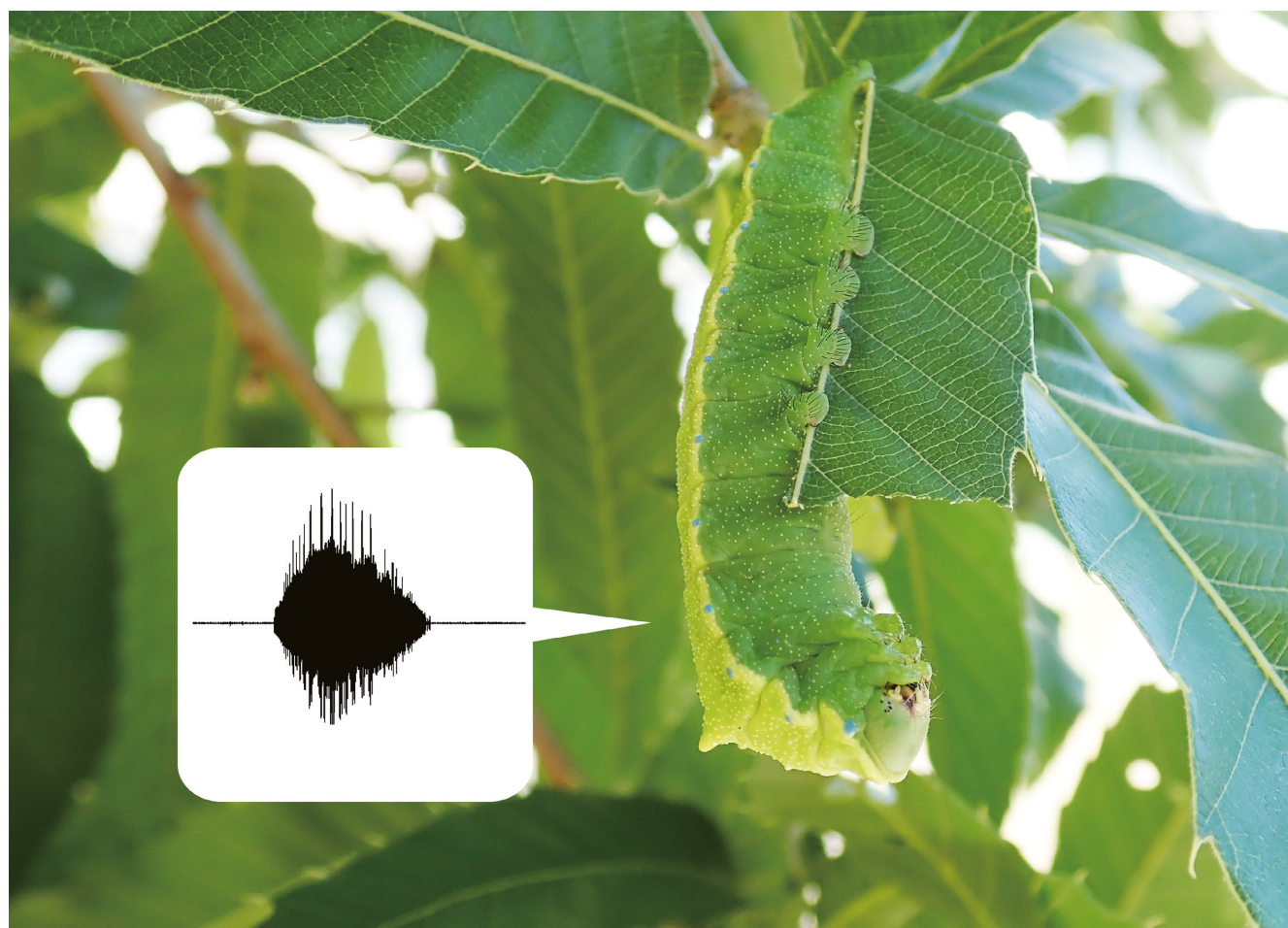


Photo 1. Last instar of *Rhodinia fugax* on a host plant leaf. The last instars produce sounds with 108- to 448-ms pulse durations, 5.6–14.5 kHz dominant frequencies, and 47.5–66.1 dB SPL. Photo credit: Shinji Sugiura.

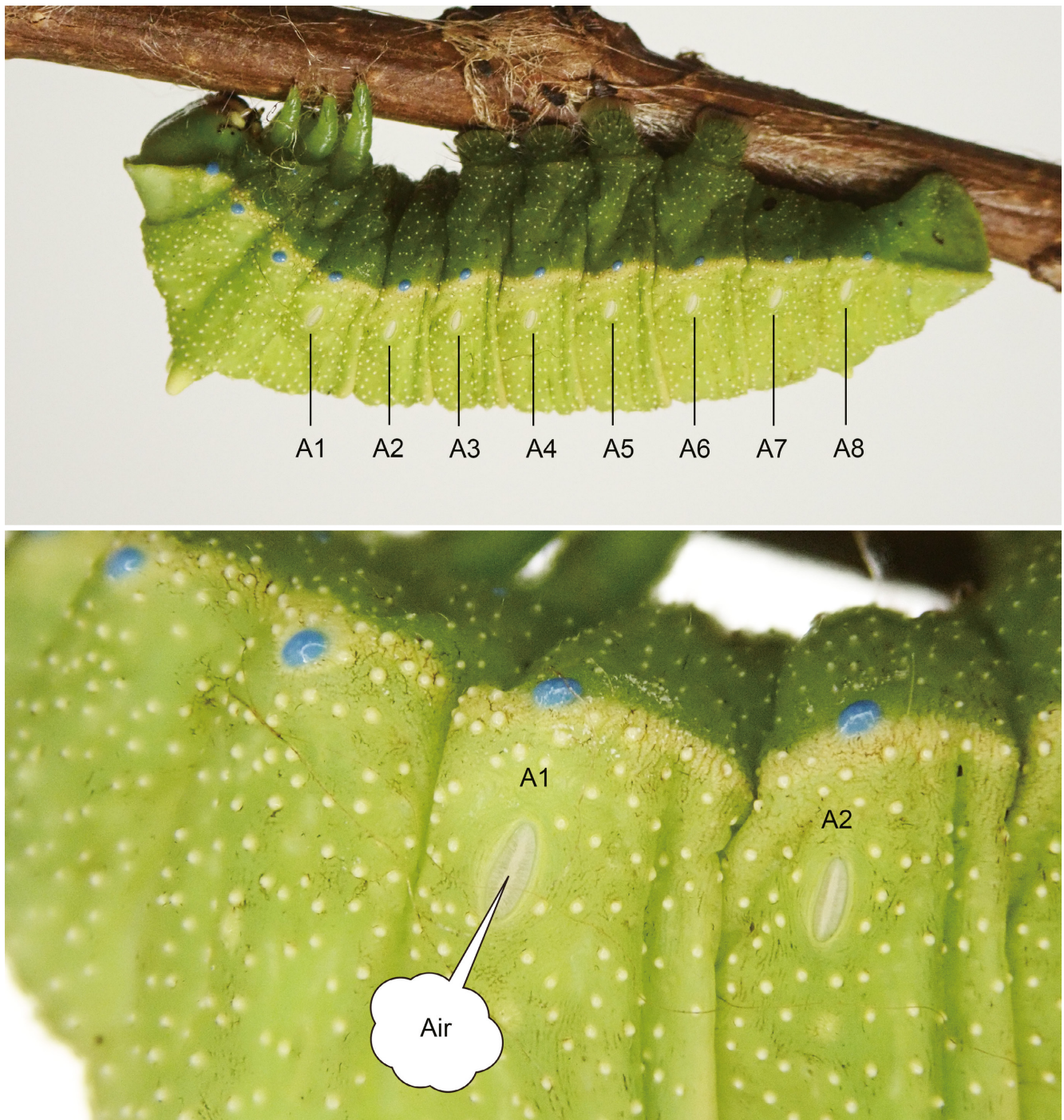


Photo 2. Sound-producing mechanism of *Rhodinia fugax*. The fifth instars have eight pairs of abdominal spiracles (top) and force air out of the first abdominal spiracles to produce sounds (bottom). Photo credit: Shinji Sugiura.

These photographs illustrate the article “Squeaking caterpillars: independent evolution of sonic defense in wild silkmoths” by Shinji Sugiura, Takuma Takanashi, Wataru Kojima, and Zenta Kajiura published in *Ecology*. <https://doi.org/10.1002/ecy.3112>