

CORRELATION BETWEEN MATING BEHAVIOR AND OVARIOLES DEVELOPMENT IN THE MEADOW SPITTLEBUG *PHILAENUS SPUMARIUS*

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The recent development of innovative applications of biotremology to manipulate the mating behavior of some species of Hemiptera has opened new possibilities for pest control. *Philaenus spumarius* (Hemiptera: Cicadomorpha) is the main vector of *Xylella fastidiosa*, the causal agent of the Olive Quick Decline Syndrome in Southern Italy. To assess whether a behavioral manipulation technique by means of playback of vibrations is feasible for *P. spumarius*, it is necessary to know when females reach their peak of mating receptivity. Females and males of *P. spumarius* exchange vibrational signals during the pair formation process, and the mating duet can induce female acceptance to copulation. On the other hand, female receptivity depends also on its physiological state, thus the development of ovarioles could be a cue to evaluate the availability to mate of females. Such a knowledge would provide significant information on the best time to employ a behavioral manipulation technique.

To evaluate when female acceptance starts to occur, we investigated a possible correlation between female mating behavior and female physiology. Our hypothesis is that the responsiveness of females to the male courtship song (MCRS) may occur only at a certain stage of ovarioles development. We individually tested 20 virgin females every 15 days from the day of eclosion as adults (mid-May) to the end of summer. Vibrational signals were recorded via two laser vibrometers. A female was placed on a plant and, after 15 minutes during which we monitored her calling activity, a playback of a pre-recorded MCRS was played onto the plant (through a mini-shaker) to assess whether they were available to establish a normal duet. The female was removed 1 minute after the end of the playback. Half of the females were dissected and their ovaries were examined under a light microscope. We also tested 15 couples every 15 days to investigate whether the physical presence of the male affected the female behavior.