

INTISARI

ANALISIS FREKUENSI DAN POLA WAKTU COURTSHIP SERTA PENGARUH STIMULUS PEMUTARAN SINYAL ARTIFISIAL TERHADAP RESPONS PERILAKU KAWIN LALAT BUAH *Bactrocera carambolae* DAN *Bactrocera cucurbitae*

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Bactrocera carambolae dan *Bactrocera cucurbitae* merupakan hama utama yang menyerang buah dan sayuran. Perilaku kawin *B. carambolae* dan *B. cucurbitae* jantan menampilkan sinyal akustik untuk menarik betina. Manipulasi sinyal akustik melalui pendekatan pemutaran merupakan salah satu langkah dalam strategi pengelolaan hama berbasis perilaku. Penelitian pertama bertujuan untuk mengetahui sinyal akustik dalam bentuk suara yaitu jenis, frekuensi, dan waktu kemunculan suara selama *courtship*. Perekaman dilakukan saat *B. carambolae* dan *B. cucurbitae* kawin menggunakan alat perekam suara pada pukul 16:00–19:00 WIB. Hasil penelitian menunjukkan ada tiga suara yang dihasilkan sebelum kopulasi yaitu *B. carambolae* menghasilkan *calling sound*, *courtship sound*, dan *stimulating sound* dengan frekuensi $352,54 \pm 11,03$ Hz, $364,06 \pm 5,83$ Hz, dan $367,50 \pm 15,31$ Hz yang dimulai pada pukul 16:09–17:56 WIB sedangkan *B. cucurbitae* menghasilkan *calling sound*, *courtship sound*, dan *stimulating sound* dengan frekuensi $274,30 \pm 3,29$ Hz, $284,65 \pm 2,00$ Hz, dan $304,36 \pm 1,82$ Hz dimulai pada pukul 16:00–18:26 WIB. Penelitian kedua bertujuan untuk mengetahui pengaruh stimulus pemutaran sinyal artifisial pada pemilihan pasangan kawin oleh betina. Sinyal dibuat secara artifisial dengan pemutaran dua *channel* yaitu *calling sound* dan *courtship sound* dengan frekuensi $352 + 364$ Hz diatur pada amplitudo 1.000 Vpp diukur pada tingkat tekanan suara 65 dB pada pukul 15:30–18:30 WIB untuk *B. carambolae* dan frekuensi $274 + 284$ Hz diatur pada amplitudo 20.000 Vpp diukur pada tingkat tekanan suara 85 dB pada pukul 15:30–19:00 WIB untuk *B. cucurbitae*. Hasil pengujian menunjukkan bahwa perilaku seksual *B. carambolae* tidak terganggu dan ditandai betina mampu merespons dan mengenali suara kawin jantan. Sedangkan perilaku seksual *B. cucurbitae* betina terganggu dan ditandai betina tidak mampu merespons dan mengenali suara kawin jantan.

Kata kunci: amplitudo, perilaku kawin, sinyal akustik, tingkat tekanan suara

ABSTRACT

FREQUENCY AND TIME PATTERN ANALYSIS OF COURTSHIP AND THE EFFECT OF ARTIFICIAL SIGNAL PLAYBACK STIMULUS ON THE MATING BEHAVIOR FRUIT FLIES *Bactrocera carambolae* AND *Bactrocera cucurbitae*

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Bactrocera carambolae and *Bactrocera cucurbitae* are the main pests that attack fruits and vegetables. The mating behavior of *B. carambolae* and *B. cucurbitae* displays acoustic signals to attract females. Manipulating acoustic signals through a playback approach is one step in a behavior-based pest management strategy. The first study aims to determine the acoustic signal in the form of sound, namely the type, frequency, and the time of appearance of the sounds during courtship. The recording was done when *B. carambolae* and *B. cucurbitae* were mating using sound recorder at 16:00–19:00 WIT (Western Indonesian Time). The results showed there were three sounds produced before copulation, namely *B. carambolae* which produced calling sound, courtship sound, and stimulating sound with frequency of 352.54 ± 11.03 Hz, 364.06 ± 5.83 Hz, and 367.50 ± 15.31 Hz which started at 16:09–17:56 WIT while *B. cucurbitae* produced calling sound, courtship sound, and stimulating sound with frequency of 274.30 ± 3.29 Hz, 284.65 ± 2.00 Hz, and 304.36 ± 1.82 Hz starting at 16:00–18:26 WIT. The second study at determine the effect of artificial signal playback stimulus on the selection of mating pairs by females. The signal is created artificially by playback of two channels, namely, calling and courtship sounds with frequencies of $352 + 364$ Hz set at an amplitude of 1,000 Vpp measured at a sound pressure level of 65 dB at 15:30–18:30 WIT for *B. carambolae* and frequencies of $274 + 284$ Hz set at an amplitude of 20,000 Vpp measured at a sound pressure level of 85 dB at 15:30–19:00 WIT for *B. cucurbitae*. The experimental results showed that the sexual behavior of *B. carambolae* was not disturbed and indicated that females were able to respond and recognize male mating sounds. Meanwhile, female *B. cucurbitae* sexual behavior was disturbed and indicated that females were unable to respond and recognize male mating sounds.

Keywords: acoustic signal, amplitude, mating behavior, sound pressure level