IDENTIFIKASI PERIODE SIRKADIAN TANAMAN CABAI MERAH BERDASARKAN PROYEKSI VERTIKAL DAN HORIZONTAL PADA SISTEM MONITORING PERGERAKAN TANAMAN

INTISARI

Oleh:

ADETYA RAYA PUTRA
13/348718/TP/10751

Aktivitas pertumbuhan dan perkembangan pada tanaman dapat dicermati dengan implementasi kerja sistem monitoring tanaman berbasis *computer vision*. Seiring dengan pertumbuhan dan perkembangannya, tanaman melakukan gerakan yang dipicu oleh jam biologis untuk membantu adaptasi terhadap pergantian waktu siang dan malam sehingga akan menghasilkan pola pergerakan yang berirama dikenal dengan istilah ritme sirkadian. Ritme sirkadian tanaman akan mengalami pengulangan setiap periode waktu 24 jam. Periode sirkadian pada tanaman tomat dapat diidentifikasi dengan implementasi sistem monitoring pergerakan tanaman secara proyeksi vertikal dengan menerapkan metode aliran optik seperti yang diangkat oleh Nugroho (2016). Pada penelitian ini periode sirkadian tanaman cabai merah didentifikasi dengan penambahan monitoring secara proyeksi horizontal dengan variasi interval lama pencahayaan terhadap tanaman cabai selama 12 jam dan 16 jam yang ditampilkan dengan grafik periodogram berdasakan analisis FFT (*Fast Fourier Transform*). Hasil penelitian menunjukan bahwa pada pengamatan secara proyeksi vertikal untuk perlakuan lama pencahayaan 12 jam dan 16 jam diketahui waktu periode sirkadian teridentifikasi 24 jam dengan nilai amplitudo masing-masing sebesar 66,5 piksel dan 92,86 piksel. Sedangkan pada pengamatan secara proyeksi horizontal untuk perlakuan lama pencahayaan 12 jam dan 16 jam diketahui waktu periode sirkadian sebesar 24 jam dengan masing-masing nilai amplitudo sebesar 33,05 piksel dan 33,92 piksel.

Kata kunci: Sistem monitoring pergerakan tanaman, ritme sirkadian, tanaman cabai merah.

IDENTIFICATION OF CIRCADIAN PERIOD OF CHILLI PLANTS BASED ON VERTICAL AND HORIZONTAL PROJECTION USING THE PLANT MOTION MONITORING SYSTEM

ABSTRACT

By:

ADETYA RAYA PUTRA
13/348718/TP/10751

Growth and development activities in plants can be observed with the implementation of plant monitoring system based on computer vision. Along with its growth and development, plants perform motions triggered by its biological clocks to help adapt to day and night turnover. These motions produce a pattern of in plants known as circadian rhythms. Circadian rhythms of plants will experience repetition every 24 hour period. Circadian period in the tomato plants can be identified with the implementation of the plant monitoring system using vertical projection of plant motion by applying an optical flow method as stated by Nugroho (2016). In this study, the chilli plant circadian period were identified by the addition of horizontal projection of plant motion with the variation of the lighting interval to the chilli plant for 12 hours and 16 hours. The circadian period in chilli plants are presented with periodogram graphs based on FFT analysis (Fast Fourier Transform). Based on the implementation of plant motion monitoring system, the results showed that on vertical projection observation for 12 hours and 16 hours lighting known to have the time of circadian period identified for 24 hours with the amplitude value of 66,5 pixels and 92,86 pixels respectively. While on horizontal projection observation for 12 hours and 16 hours long lighting known to have the circadian time period is 24 hours with the amplitude value 33,05 pixels and 33,92 pixels respectively.

Keywords: Plant motion monitoring system, circadian rhythms, chilli plants.

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