# Disruption of Circadian Rhythm: Its Effects on Glucose Production and Photosynthesis Activity

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The photoperiodic circadian rhythm in plants helps direct when photosynthesis occurs, and controls an organism's response to light/dark patterns. Hedera helix (common ivy) was the plant used to investigate how the disruption of their photoperiodic biological clock affects the processes in photosynthesis. Twelve ivy plants were grown under fluorescent lights for a week to acclimate the circadian rhythm to the original photoperiod. Before disruption, they were exposed to light from 8am to 7pm and exposed to dark from 7pm to 8am. Benedict's test was performed on same size leaf samples from each H. helix for three days before the photoperiod disruption to get a pre-disruption measurement of glucose produced. Along with the Benedict's test, a colorimeter was used to measure loss of color from DCPIP during the Hills reaction to measure electron flux through the Photosystem II (PSII) in photosynthesis. On disruption day, the set times of light and dark were switched. The plants received light from 8am to 7pm and no light from 7pm to 8am. For three days after disruption of photoperiod, the average amount of glucose was recorded again from the Benedict’s test. The Hills reaction was done again to test electron flux through PSII. The average glucose production plummeted after disruption and the rate at which the election goes through photosynthesis decreased compared to before disruption. Glucose and PSII activity before and after disruption of photoperiod was tested with a paired t-test and showed that there was a significant drop in glucose production after disruption.

**Awards Won:**