



5TH INTERNATIONAL CONFERENCE ON KNOWLEDGE & INNOVATION IN ENGINEERING, SCIENCE & TECHNOLOGY

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VIENNA, AUSTRIA

Carbon dioxide uptake of extensive green roof using C3 and CAM

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ABSTRACT

Extensive green roof has been popular since the beginning of 21th century due to its lightweight. Cam plants were also popular at the same time due to their tolerant to heat and need a few maintenance. Anyhow researched have been proved that their capacity in heat reduction were low as well as carbon dioxide uptake, since they closed their stomata in the daytime and uptake carbon dioxide at night.

This research was done on the green roof of Thai Nishimatsu in 2017, measuring thermal performance of green roof with 2 plants Creeping daisy (*Wedelia trilobata* (L.) A.S. Hitchcock) and Mini turtle plants (*Callisia Repens*) on the same roof. Carbon dioxide was measured separately at Faculty of Architecture Kasetsart University. For Carbon dioxide uptake Creeping daisy is a normal C3 plants who absorb CO₂ in the daytime and release CO₂ at night time. The result show absorption start from 7.03 am when there is sunlight and rise to max. of 27.65 $\mu\text{mol}/\text{m}^2/\text{s}^1$ at 15.03 am then decrease to zero at 7 pm to maximum release of CO₂ at -22.34 $\mu\text{mol}/\text{m}^2/\text{s}^1$ at 0.03 am. For Mini Turtle Plant (*Callisia Repens*) is a CAM plant who close stomata in the daytime to save water from transpiration but still start release CO₂ at 6 pm to 4 am at maximum of -11.49 $\mu\text{mol}/\text{m}^2/\text{s}^1$ at 10.01 am in the day time until 5.04pm then gradually uptake CO₂ to maximum of 8.71 $\mu\text{mol}/\text{m}^2/\text{s}^1$ at 8.04 pm at night then down to zero at 4.04 am.

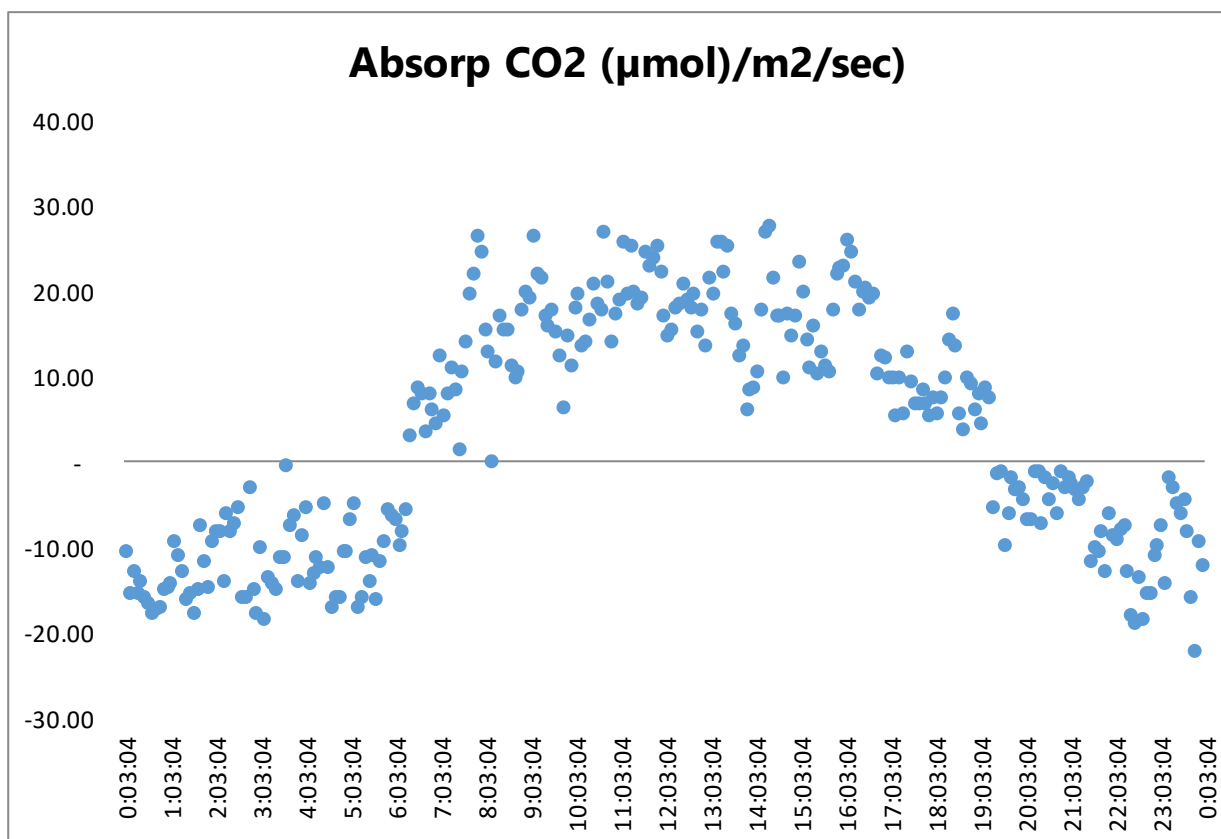
Keywords: Light weight green roof; creeping daisy; Mini turtle plants; Crassulacean acid metab



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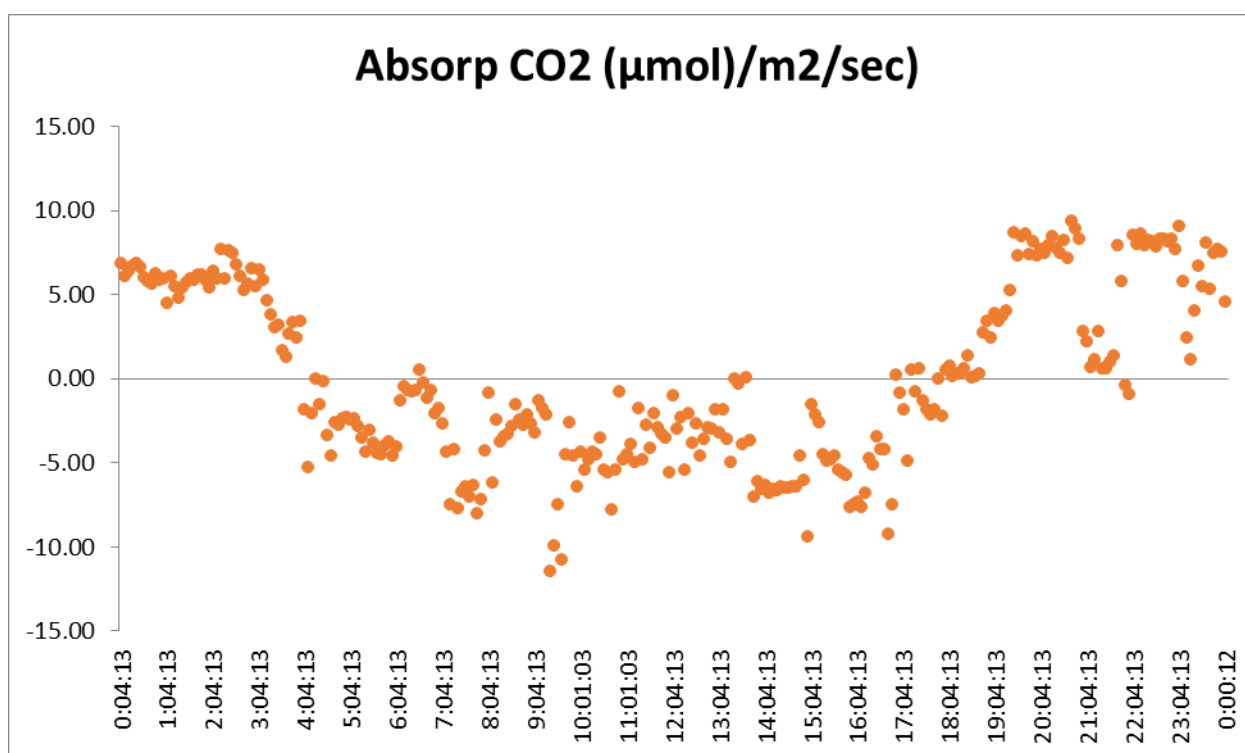


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Creeping daisy (*Wedelia trilobata* (L.) A.S. Hitchcock)



Mini Turtle Plant (*Callisia Repens*)