

## Evaluation of the Gas Exchange Characteristics of Selected Plant Species of Universiti Tun Hussein Onn Malaysia, UTHM

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**Abstract :** The maximum carboxylation rate of Rubisco ( $V_{cmax}$ ) and the maximum electron transport rate ( $J_{max}$ ), light compensation point (LCP), light saturation point (LSP), maximum photosynthesis ( $A_{max}$ ), and apparent quantum yield ( $A_{qy}$ ) are gas exchange characteristics that are derived from the carbon dioxide ( $CO_2$ ) and light response curves. This characteristics can be affected by the level of  $CO_2$  and light received by the plant. Moreover, the characteristics determines the photosynthetic capacity of the plant. The objective of the study is to evaluate the gas exchange characteristics of selected plant species of UTHM. Photosynthetic carbon dioxide ( $A/C_i$ ) and light ( $A/Q$ ) response curves were measured using portable photosynthesis system (LICOR). The results shows that both  $A/C_i$  and  $A/Q$  curves increases as  $CO_2$  and light increases, but reach to a certain point where the curves will become saturated. *Spathodea campanulata* was having the highest  $V_{cmax}$  ( $52.14 \pm 0.005 \mu\text{molCO}_2 \text{ m}^{-2}\text{s}^{-1}$ ),  $J_{max}$  ( $104.461 \pm 0.011 \mu\text{molCO}_2 \text{ m}^{-2}\text{s}^{-1}$ ) and  $A_{qy}$  ( $0.072 \pm 0.001 \text{ mol CO}_2 \text{ mol}^{-1} \text{ photons}$ ). The highest LCP was observed in *Rhaphis excelsa* ( $69.60 \pm 0.067 \mu\text{mol photons m}^{-2}\text{s}^{-1}$ ) while the highest LSP was recorded for *Costus spicatus* ( $1576.69 \pm 0.173 \mu\text{mol photons m}^{-2}\text{s}^{-1}$ ). It was concluded that the plants need high light intensity and  $CO_2$  for their maximum assimilation rate.

**Keywords :** Gas,  $CO_2$ , Exchange, Plants

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