# Traits of photosynthetic $^{12}CO_2$ and $^{14}CO_2$ assimilation in leaves of *Triticum aestivum* at very low irradiances.

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Light curves of $CO_2$ exchange in leaves of *Triticum aestivum* were measured simultaneously with $^{12}CO_2$ and $^{14}CO_2$. $^{12}CO_2$ assimilation curve under 400μLL$^{-1}$ $CO_2$ and 210mLL$^{-1}$ $O_2$ was linearly related to the flux density of absorbed PAR from darkness to 10-15μmol photons m$^{-2}$ s$^{-1}$. At higher irradiances the slope of $CO_2$ assimilation curve decreased. The Kok effekt appeared also in the medium of low $O_2$ (15mLL$^{-1}$) and high $CO_2$ (2300μLL$^{-1}$). These measurements showed that inhibition of respiration started at very low irradiances.

To the contrary, light curves measured with $^{14}CO_2$ exhibited a lag-phase up to irradiances corresponding to the breaking point of $^{12}CO_2$ curve. Under higher irradiances both light curves had the similar slopes. Rates of $^{14}CO_2$ assimilation showed somewhat higher values due to respiratory $^{12}CO_2$ evolution from leaves under low light. The lower quantum yield of $^{14}CO_2$ assimilation up to irradiance 10-15 μmol photons m$^{-2}$ s$^{-1}$ refer to the existence of alternative acceptors of electron transport. One of the possible alternative acceptors may be reduction of $NO_3^-$ ion. However,in our experiments $NO_3^-$ or $NH_4^+$-fed Triticum plants showed no differences in photosynthetic rate, Kok efect and range of the lag phase of $^{14}CO_2$ assimilation.

Both the young (2 weeks old) and mature (1.5months) plants had the same shape of $^{12}CO_2$ and $^{14}CO_2$ light curves. However, in leaves of elder plants the breaking point of Kok effect and the end of $^{14}CO_2$ assimilation lag-phase was achieved at lower irradiances, approxymately 7 μmol photons m$^{-2}$ s$^{-1}$.