Title Determination of respiratory parameters of onion bulbs (*Alium cepa* L.) under total anozia

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Abstract

This works aimed to investigate the effect of total anoxia (100 N_2) on the respiratory parameters of onion bulbs. Freshly harvest onion bulbs cv. Rouge Amposta obtained from organic farming were used for this experiment. Under total anoxia, Fermentative Index (FI) values were 0.048, 0.072 and 0.l4mmole CO_2 $kg^{-1}h^{-1}$ at 4, 10 and 20 °C, respectively. The fermentative process was temperature dependent and followed an Arrhenius-like equation (R^2 = 0.992). The Q10 of onion bulb under anoxia was 1.93 and FI0 (fermentative index at 0°C) was estimated at 0.037 mmole CO_2 $kg^{-1}h^{-1}$ with an activation energy of 44,578 J $mole^{-1}$. Moreover, the FI of the bulbs (in mmole CO_2 $kg^{-1}h^{-1}$) was measured within 6 h after closing the vessels (jars). Beyond 24 h at 20°C, high CO_2 production was likely to be due to anaerobic or aero/anaerobic microorganisms such as yeast and lactic acid bacteria. Furthermore, ethanol production under anoxia was also estimated and averaged <0.001, 0.55 and 0.79 pmole $kg^{-1}h^{-1}$ at 4, 10 and 20°C, respectively. These results indicated that onion bulbs are less sensitive to anoxia and tolerated total anoxia for at least 24 hours.