

The reduction of the stress response by jasmonic acid and putrescine has a beneficial effect on *in vitro* tuber formation and development of yam

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In vitro culture is a source of stress conditions (Kevers et al. 2004), especially the cutting of the shoot and during the transfer phase on a new medium. Tubers can be initiated and can develop *in vitro* from nodal cuttings of yam (*Dioscorea cayenensis* - *D. rotundata* complex). The effect of exogenous jasmonic acid (JA) and putrescine (PUT), alone or in combination, was investigated on yam tuberisation in relationship with endogenous JA and polyamine levels.

Application of exogenous JA and PUT positively affected microtuber formation and growth from yam nodal cuttings. In control conditions, three weeks were needed to obtain 100% of tuberisation. With low concentrations of PUT (10^{-5} or 10^{-6} M), tuber formation occurred earlier (within one week). The endogenous polyamine levels and their metabolism are significantly affected by exogenous PUT. Moreover, with low concentrations of JA (0.1 μ M), tuber formation occurred also earlier (46% after one week). The exogenous presence of JA did not significantly affect the endogenous level of JA but significantly affected the polyamine endogenous level. However the time course of these different changes did not correlate with the timing of tuber formation.

Exogenous application of higher concentration of JA (0.3 μ M) and PUT (1 mM) in combination had an additional effect on tuber formation (precocity) and growth (weight and length). On the contrary, at lower concentrations, these two regulators had an antagonism effect suggesting that JA could inhibit the polyamine-induced effect.

The endogenous stress induced by the plant transfer is reduced by the presence of PUT or JA in the medium that could be beneficial for a rapid tuber formation. The use of these regulators modifies the endogenous metabolism of polyamines and thus could improve *in vitro* conditions for mass production of larger microtubers in *Dioscorea cayenensis*-*D. rotundata* complex.

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