In Vitro Culture and Microtuberization of 'Spunta' Potato (*Solanum tuberosum* L.)

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ABSTRACT

Effect of different levels of 6-benzylaminopurine (BAP) and naphthaleneacetic acid (NAA) and BAP and sucrose on *in vitro* shoot (SH) proliferation and microtuberization of 'Spunta' potato was studied using virus-free plantlets on modified Murashige and Skoog (MS) media.

NAA at 2.0 mg l^{-1} and BAP at 0.5 mg l^{-1} resulted in the longest main SH (22 cm) with highest node numbers (23 nodes). A maximum of 15 axillary SHs per main SH was produced after 10 weeks of incubation on the modified MS proliferation media in presence of 2.0 mg l^{-1} BAP and 0.1 mg l^{-1} NAA.

Sucrose at 40 g l^{-1} when associated with 0.1 mg l^{-1} BAP was optimal for obtaining the maximum number of microtubers (MTs) *in vitro*. Severn MTs per SH and 1.35 MTs per node were obtained after 20 and 8 weeks, respectively. Largest MT weight and size resulted from media with 80 g l^{-1} sucrose supplemented with 0.1 mg l^{-1} BAP.

On basis of space required and media used, single nodal cuttings with leaf (SNCs) seem to be more applicable for induction of MTs *in vitro*; contamination hazards are also reduced.

INTRODUCTION

Propagation by tissue culture provides the opportunity for having virus free *in vitro* cultures used for micropropagation of large quantities of plantlets (Estrada et al., 1986) to produce MTs *in vitro* or minitubers *in vivo*. MTs can be used as an additional component to the standard methods of rapid propagation used in seed tuber production (Dodds, 1988) and utilized for the distribution of germplasm (Dodds, 1988; Epinoza et al., 1989) quite conveniently.

In vitro potato microtuberization has been reported (Harmey et al., 1966; Hussey and Stacey, 1984; Lillo, 1989) using different types of explants including nodal (Harmey et al., 1966; Hussey and Stacey, 1984) and *in vitro* SH (Lillo, 1989) cuttings.

Several media for propagation under aseptic conditions were also tested (Miller et al., 1985; Estrada et al., 1986; Dodds, 1988). Most multiplication programmes use modified MS media (Murashige and Skoog, 1962) with variable supplements of vitamins and plant bioregulators (PBRs) (Estrada et al., 1986). In general, increasing the sucrose concentration from 10 to 80 g l^{-1} increased the percentage and earliness of microtuberization (Wang and Hu, 1985). Wang and Hu, (1982) found that sucrose at the concentration 80 g l^{-1} was optimum for the *in vitro* microtuberization from *in vitro* rooted SHs.

In vitro microtuberization always resulted when exogenous cytokinins were used (Wang and Hu, 1985). 10 mg l^{-1} BAP induced the highest number of MTs from *in vitro* rooted SHs within a concentration range of 0.01 to 30.0 mg l^{-1} (Wang and Hu, 1982).

Hence, this investigation was initiated to study the possible effect of different levels of cytokinin, auxin and sucrose on *in vitro* SH proliferation and microtuberization of the locally used 'Spunta' potato.

MATERIALS AND METHODS

In vitro virus-free potato plantlets of 'Spunta' (accession number 800923) were provided from the International Potato Center (CIP), Lima, Peru. The plantlets were certified to be free from: potato

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