**Abstract**

Lack of cost-effective protocols has hampered wide-scale application of slow growth *in vitro* conservation of potato. Therefore, the potential of cassava starch as an alternative low cost gelling agent for potato *in vitro* conservation media at normal propagation temperature was investigated using a two factor experiment in a randomized complete block design for a period of 18 months. Three gelling agents: i) cassava starch (8%) + agar (0.25%), ii) cassava starch (8%) and iii) agar (0.8%) were evaluated using three varieties (Arka, Dutch Robijn and Tigoni). Plantlet survival and condition of plantlets after 18 months of conservation was comparable when cassava (8%) + agar (0.25%) and agar (0.8%) were used as gelling agents for all the three varieties and were higher than survival and condition of plantlets grown on media gelled with cassava starch (8%) alone. Plantlets grown on media gelled with cassava starch (8%) + agar (0.25%) and agar (0.8%) alone, respectively, had higher numbers of usable single node cuttings per culture than plantlets grown on cassava starch (8%) regardless of the variety. Gelling costs were reduced by 16.6 and 24.4 % when cassava (8%) + agar (0.25%) and cassava (8%) alone were used, respectively, as the gelling agents compared to agar (8%) alone. However, media gelled with cassava starch (8%) alone had poor clarity and gel strength indicating its unsuitability for conservation**.** All plantlets that survived the 18-month conservation period had 100% viability irrespective of the type of conservation media used that was used. Therefore, cassava starch (8%) + agar (0.25%) may be used as a cheaper alternative for agar in potato conservation media.