ABSTRACT

Blackberry is a crop of great economic potential but it has not been exploited commercially in Kenya. Breeding and commercial production of blackberry requires rapid propagation which is not possible through the traditional seed and vegetative techniques. This study aimed at developing an efficient protocol for rapid multiplication of blackberry (Rubus sp). The study comprised of seven separate experiments to establish the best sterilization protocol, explant size, source of explants, callus induction, shoot induction and elongation and rooting experiments using varying plant hormone concentrations. The experiments were laid out in a Completely Randomized Design with three replications. Data was collected on percent contamination and survival rates, callus fresh weight, callus color and morphology, shoot length, number of shoots, root length, number of roots, and root fresh weight. The data were subjected to analysis of variance (ANOVA) and means separated using Tukeys' Honestly Significant Difference Test (Tukeys' HSD) at 5% level of significance. For sterilization experiments, washing with tap water, Caberndezim for 10min, 5% NaOCl for 2 min and 70% ethanol for 2 min gave the least contamination of 11.1% and the highest survival rate of 5.1 explants per culture vessel. Shoot tips had the highest survival rates of explants per vessel with Rubus fruiticosus giving 96% survival. There were significant effects explant sizes of R. apatelus on survival rates. The 2.1-3.0 cm sized explant gave the highest survival rate of 93.3%. There were significant differences in the fresh weight of callus of the blackberry species and the hormone concentration: 2.0 and 2.5 mg/l 2,4-D gave the highest fresh weight for R. fruiticosus species of 60.2 and 57.5 mg respectively. Treatments with 2.5mg/l BAP and 0.5 mg/l NAA showed the highest number of leaves of 12.6, 12.3 and 11.7 for Rubus fruiticosus, Rubus apatelus and Rubus volkenisis respectively and fresh weight of 1.8mg, 1.7mg and 1.8 mg Rubus fruiticosus, Rubus apatelus and Rubus volkenisis respectively. Maximum shoot initiation and growth was achieved with 2.5mg/l BAP supplemented with 0.5 mg/l NAA while that for rooting in all the species was achieved on MS medium supplemented with IBA at 3.0 mg/l. In conclusion, washing the explants with tap water followed by dipping in caberndezim for 10min, then 5% NaOCl for 2 min and 70% ethanol for 2 min gave the least contamination of 11.1% and the highest survival rate of explants per vessel of 5.1 explants. Two and 2.5 mg/l 2, 4-D gave a white green friable callus. Two and a half milligrams per liter of BAP supplemented with 0.5 mg/l NAA showed rapid shoot proliferation and 3 mg/l IBA for root proliferation. These concentrations should be adopted for mass seedling propagation in breeding and commercialization ventures.