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Short Communication

Micropropagation of rose cultivar 'Pareo'

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A protocol was developed for micropropagation of rose cv. 'Pareo'. Nodal segments were surface sterilized with 0.1% solution of mercuric chloride for 10 min and these disinfected explants were inoculated aseptically on culture medium. The, axillary shoots were regenerated from nodal explants on agar-gelled Murashige and Skoog medium supplemented with 1.5 mg/l BAP. *In vitro* rooting was obtained when shoot clusters were cultured on half strength Murashige and Skoog medium supplemented with 1.0 mg/l IBA. The rooted plantlets were acclimatized successfully in the field.

Key words: Micropropagation, nodal segments, rose.

INTRODUCTION

Rose the most important commercial ornamental crops, has cultivars which are traditionally propagated by cuttings or grafting onto seedling or clonal rootstocks. However, grafting is expensive and conventional breeding is a time consuming procedure. Tissue culture can be used as an alternative to traditional propagation methods. In contrast to grafting, tissue culture can yield large numbers of self-rooted plants in a very short time.

A successful micropropagation protocol proceeds through a series of stages, each with a specific set of requirements. These are initiation of aseptic cultures, shoot multiplication, rooting of microshoots, and hardening and field transfer of tissue culture raised plants (Roy et al., 2004; Khosh-Khui and de Silva, 2006; Canli and Kazaz, 2009; Mukhambetzhanov et al. 2010; Nam et al., 2011).

In this study, a protocol was developed for *in vitro* multiplication of rose cultivar 'Pareo' with nodal explant as an initial plant material.

Cultivar 'Pareo' is an orange blend, hybrid tea rose, bred by Seizo Suzuki,1991 (United States – Patent, 1992).

MATERIALS AND METHODS

Nodal explants containing lateral buds of actively field-grown 'Pareo' rose were cultured on Murashige and Skoog medium (Murashige and Skoog, 1962) supplemented with different concentration of BAP singly or in combination with NAA and kinetin. The pH of medium was adjusted to 5.7 and solidified by 0.6 g/l 'Fluka' agar. It was autoclaved at 121°C and at 1 kg/cm^2 pressure for 20 min. For subsequent subcultures, BAP (1.0 to 2.0 mg/l) singly or in combination with a concentration of 0.1 mg/l IBA were added to the basal medium for induction of multiple shoots. For root induction, Murashige and Skoog medium at half strength with 0.5 to 2.0 mg/l, either IBA, IAA or 2.4 D was used. After inoculation, all cultures were grown under a photoperiod of 16 h light from white fluorescent tubes at a temperature of 25 ± 1°C.

RESULTS AND DISCUSSION

After four weeks of culture, nodal segment explants showed different responses in production and development of multiple shoots when cultured on Murashige and Skoog medium with different concentrations of BAP and 20 g/l sucrose.

Shoot tips provide superior explants as compared to adventitious buds in the vegetative propagation because of the reduced risk of genetic instability. Among the various phytohormones concentrations and combinations used in this study, 1.5 mg/l BAP was found to be the best to yield the highest number of multiple shoots (Figure 1A). The highest number of multiple shoots per explant recorded was 1.3. The maximum length of shoots was also obtained in this combination (Figure 1B). Maximum multiplication of shoots was also obtained in the same medium. The highest number of multiple shoots per subcultured shoot was 3.6.

Among the three auxins (IBA, IAA and 2.4-D) tested for to be more effective in root production as compared to

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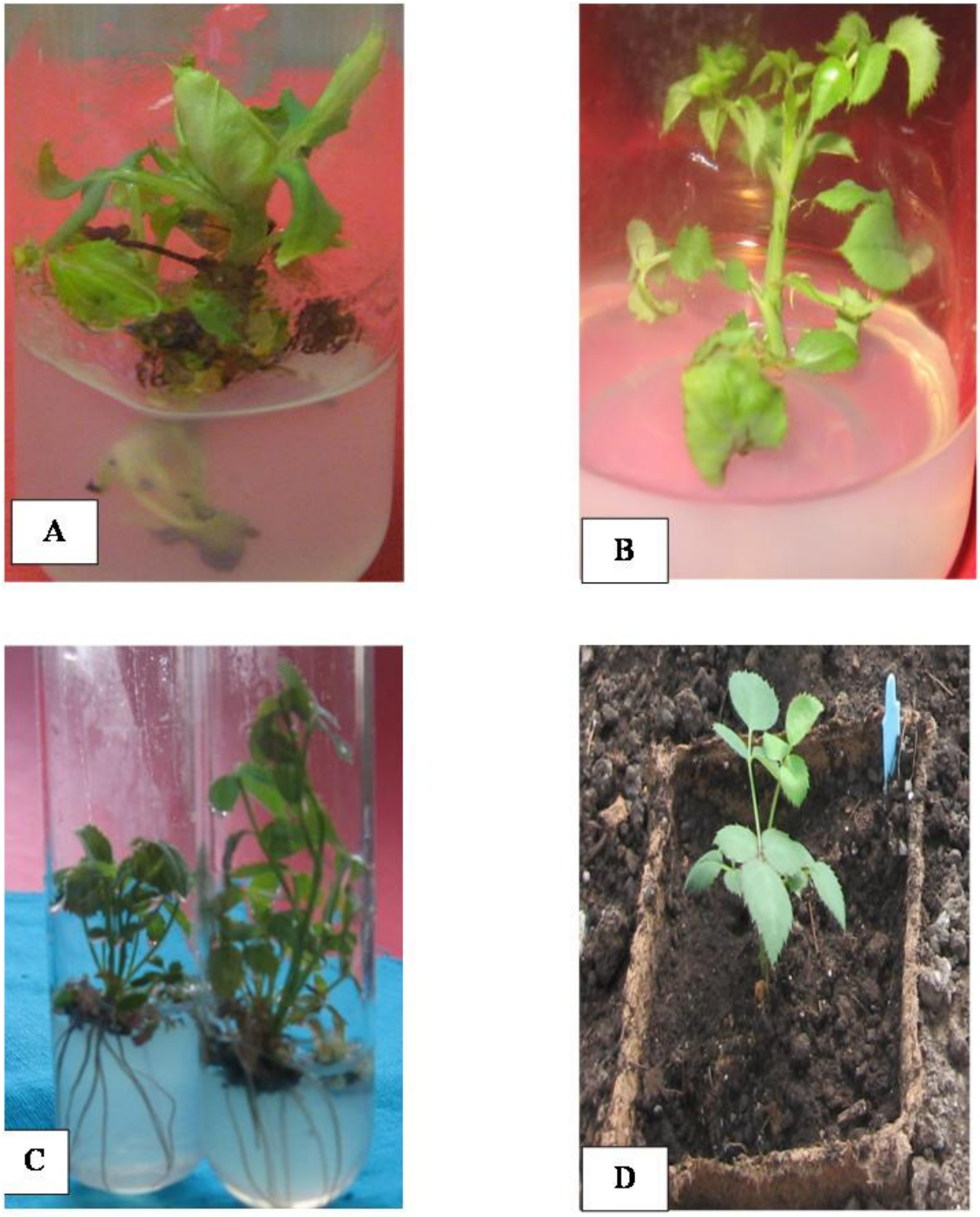

Figure 1. *In vitro* regeneration of plantlets of 'Pareo' rose cultivar. A, Adventitious shoots formation on MS + 1.5 mg/l BAP from nodal explant; B, multiplication of single shoot on MS + 1.5 mg/l BAP; C, rooting of shoots on half strength of MS + 1.0 mg/l IBA; D, potted plantlet after eight weeks of transfer under natural environment.

root induction, 1.0 mg/l IBA and 0.5 mg/l IAA was found others and the rooting rate was 100% (Figure 1C). Inclusion of 2.4-D (2 mg/l) in the medium induced low rate of rooting.

Rooted plantlets were planted in turf pots filled with commercial non-sterile garden soil and successfully acclimatized in green-house condition. When hardened, these were transferred to soil (Figure 1D). 80% of the plantlets produced from *in vitro* cultures survived in *ex vitro* condition.

The established protocol in this investigation is a reproducible plant regeneration system from nodal

segments of rose cultivar ‘Pareo’.

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