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# Rapid multiplication of Jojoba seedlings by *in vitro* culture

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**Abstract**

Jojoba (*Simmondsia chinensis*, (Link) Schneider) seedling explants were cultured on a modified Driver Kuniyuki medium, supplemented with various concentrations of 6-benzyladenine alone and in combination with silver nitrate. Shoot proliferation was successful at all the concentrations tested, with a maximum number of 15.2 shoots per original explant. Shoots produced during the proliferation stage were treated with $\alpha$-naphthaleneacetic acid, indole-3-butyric acid and indole-3-acetic acid to induce rhizogenesis, reaching 64% rooting in some treatments. When the rooted explants were transferred to the mist system for acclimatization, 90% of them survived and continued to grow after a period of one month.

*Abbreviations:* BA – 6-benzyladenine; DKW – Driver Kuniyuki Walnut medium; IAA – indole-3-acetic acid; IBA – indole-3-butyric acid; NAA – $\alpha$-naphthaleneacetic acid

## Introduction

Intense interest has developed in the use and exploitation of non edible plants and plant products, e.g., jojoba (*Simmondsia chinensis*, (Link) Schneider). Jojoba is an evergreen, to some extent salt tolerant, dioecious shrub, with increasing industrial interest, due to the use of its oil and oil-derived compounds in the cosmetic, petroleum, pharmaceutical and plastic industries (Jacoboni and Standardi, 1987; Benzioni et al., 1992; Mills and Benzioni, 1992). It can also grow in infertile and arid soils, where other commercial crops cannot grow satisfactorily.

Jojoba is propagated by sexual and vegetative methods. In plant populations derived by sexual propagation it is difficult to determine sex type in early stages of growth and plants are genetically variable, which affects growth uniformity, physiological characteristics, yield and early bearing. (Mills et al., 1997). On the other hand asexual propagation methods provide genetically uniform plant material (Alcaraz and Ayla-Rocha, 1982; Won Lee and Palzkill, 1984).

Cloning individual seedlings to provide genetically uniform plant material would be useful, since many genetically uniform plants could be evaluated in a relatively short period of time. *In vitro* plant regeneration from nodal explants of mature jojoba shrubs has been described but the multiplication rate was low (Mills et al., 1997). Furthermore, the rooting percentage ranged between 20 and 95% depending on the clone and the specific trial (Mills et al., 1997).

This paper reports a simple method and potential culture medium for the rapid multiplication of jojoba seedlings along with a relatively simple procedure of acclimatizing rooted explants under mist with a high survival rate.

## Materials and methods

Jojoba seedlings were grown in perlite in a growth chamber with 25±1 °C, 70% relative humidity and a 16-h photoperiod, provided by cool white fluorescent lamps (38 $\mu$mol $m^{-2}$ $s^{-1}$). Shoot tips and nodal segments, 10–15 mm long, were collected and prepared aseptically from 8–10 weeks old seedlings. The leaves of the explants were excised and the explants were disinfected in a solution of 1.2% w/v sodium hypochlorite