IN VITRO CLONAL PROPAGATION OF A PROMISING AGROFUEL PRODUCING-PLANT : *JATROPHA CURCAS* L.

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Abstract : In the present investigation, *in vitro* clonal propagation of two-month-old *Jatropha curcas* L. was achieved employing nodal explants. Axillary shoot bud proliferation was best initiated on Murashige and Skoog's (MS) basal medium supplemented with N6-benzyladenine (BA) and adenine sulphate. This medium allowed the production of 3.1 ± 0.5 shoots per nodal explant with 3.5 ± 0.8 cm average length after 3-4 weeks.

Introduction

Jatropha curcas L. is considered as one of the most interesting potential source of non-edible biofuel. This study focuses on the development of a regeneration protocol from nodal explants that could be of a great help in the multiplication and the release of elite clones.

Material

- Plant material : two genotypes from Senegal and Madagascar.
- Culture medium : Murashige and Skoog (1962) with 8.87 µM of BA and 4.93 µM of IBA , 30 g/L sucrose and 0.7% agar.
- Shoot proliferation media : MS and a medium containing Quoirin and Lepoivre's macro-elements (1977), microelements and vitamins of MS to which were added 13.31 µM BA and 9.85 µM IBA.
- Cultivation conditions : under 12 h light/dark cycles (artificial light, 80 µmol per sq. m per s), 27 ± 2°C, and 60 % relative humidity.

Results and discussion

- One week : 100% budbreak of axillary and apical buds.
- Three weeks : no difference between the two genotypes tested (Madagascar and Senegal). The stems are isolated from the explants and subcultured after three weeks (Fig. 1 : adventitious shoot-bud).

Highly significant differences ($p<0,01$) were observed between the two proliferation media PM1 and MP2 regarding the multiplication rate and the stem length (Fig. 2 and 3).

PARAMETER	MP1	MP2
Multiplication rate (number of nodes /stem)	3.1 ± 0.5	2.5 ± 2.1
Length of stems (cm)	3.5 ± 0.8	3.1 ± 0.9

- These results are similar to those obtained by Datta *et al.* (2007) with 22.2 µM BA in combination with IBA and 55.6 µM adenine sulphate.
- Callus proliferation is important in all environments, planting and proliferation, as reported by Weida *et al.* (2003), during the regeneration of plantlets from explants of hypocotyls and petioles of *Jatropha curcas* leaves in a medium supplemented with BA and IBA.
- However, we have observed that Jatropha requires higher concentration of only one type of cytokinin (BA) for the induction phase and that lower concentration of another type of cytokinin (e.g. kinetin) may limit the callus formation.

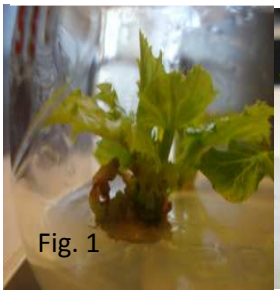

Fig. 1 : Axillary bud breaking after 4–6 weeks of culture

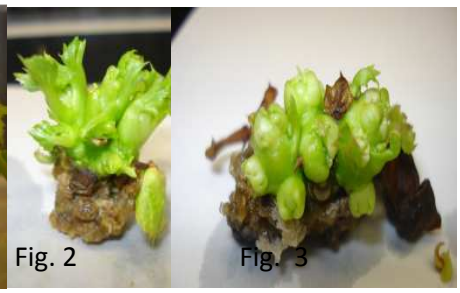

Fig. 2 and **3 :** Proliferation of shoots after 8–10 weeks of culture

Conclusion

These preliminary results will help to improve the proliferation rate and allow us to start the investigations regarding the rooting stage and the monitoring of the compliance of the produced vitroplants after the phase of acclimatization.

References

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