

LIST OF ABSTRACTS
RESEARCH ADVANCES ON IN VITRO CULTURE AND
MICROPROPAGATION IN FRANCE

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Abstract

CIRAD had developed plant regeneration systems through somatic embryogenesis and microcutting. In partnership with Michelin, CIRAD used the primary somatic embryogenesis process for rejuvenation of *Hevea* clones. Several varietal types such as self-rooted plants and rejuvenated budded clones were evaluated in field trials (Montoro et al. 2012a). Indirect secondary somatic embryogenesis through friable embryogenic callus has been established on clone PB 260 for further large-scale propagation (Lardet et al. 2009; Lardet et al. 2007). The embryogenic capacity of friable callus lines is variable. Given the plant regeneration process takes about 6 months, expression marker genes have been searched in the early stage of callus proliferation (Piyatrakul et al. 2012). Evaluation of in vitro plant material did not reveal any improvement of growth and latex production compared with conventional budded material. Restricted to a few number of clones, the indirect secondary somatic embryogenesis was used for genetic engineering applications. An efficient *Agrobacterium tumefaciens*-mediated genetic transformation method is now used routinely for functional analyses of candidate genes (Blanc et al. 2006; Leclercq et al. 2010; Montoro et al. 2003; Montoro et al. 2000; Rattana et al. 2001). Oxidative stress being involved in the aggregation of rubber particles and consequent Tapping Panel Dryness, strengthening antioxidant systems was attempted by increasing the activity of reactive oxygen species (ROS)-scavenging enzymes (CuZnSOD) and the content in antioxidants (glutathione). These genetic modifications led to dramatically increase the vigour of transgenic plants, their biomass, and some ecophysiological parameters under abiotic stress conditions (Leclercq et al. 2012). The recent development of new generation of sequencing techniques led to identify transcription factors regulating defence genes in particular ROS-scavenging systems (Duan et al. 2013; Piyatrakul et al. 2014). Finally, genetic modifications have been carried out to generate mutants affected in signalling in order to dissect defence and developmental mechanisms (Montoro et al. 2012b).

RESEARCH PROGRESS ON DEVELOPMENT OF *HEVEA* TISSUE CULTURE
IN INDOONESIAN RUBBER RESEARCH INSTITUTE

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Abstract

Generally rubber plant propagation carried out by grafting technique up to this time. However, the planting material produced by this technique had been mature clonal type so that the superiority potential of growth and productivity could not be realized at its optimum.