

## **Epigenetic changes and their relationship to somaclonal variation: a need to monitor the micropropagation of plantation crops**

### **ABSTRACT**

Chromatin modulation plays important roles in gene expression regulation and genome activities. In plants, epigenetic changes, including variations in histone modification and DNA methylation, are linked to alterations in gene expression. Despite the significance and potential of in vitro cell and tissue culture systems in fundamental research and marketable applications, these systems threaten the genetic and epigenetic networks of intact plant organs and tissues. Cell and tissue culture applications can lead to DNA variations, methylation alterations, transposon activation, and finally, somaclonal variations. In this review, we discuss the status of the current understanding of epigenomic changes that occur under in vitro conditions in plantation crops, including coconut, oil palm, rubber, cotton, coffee and tea. It is hoped that comprehensive knowledge of the molecular basis of these epigenomic variations will help researchers develop strategies to enhance the totipotent and embryogenic capabilities of tissue culture systems for plantation crops.