

## Induction and Cytological Studies of *Coffea arabica* cv. Catimor CIFC 7963 Callus

Sirada Katnim and Noppamart Lökkamlue\*

*Department of Genetics, Faculty of Liberal Arts and Science, Kasetsart University Kamphaeng Saen Campus, Nakhon Pathom 73140, Thailand*

\*Corresponding author. E-mail: faasnmlo@ku.ac.th  
<https://doi.org/10.12982/CMUJNS.2020.0027>

Received: March 7, 2019

Revised: May 17, 2019

Accepted: August 26, 2019

### ABSTRACT

*This study investigated the effect of activated charcoal (AC) and 4-amino-3,5,6-trichloro-2-pyridinecarboxylic acid (picloram) on callus induction and occurrence of mitotic aberrations in coffee cells. Explants from the first pair of expanded leaves (1<sup>st</sup> leaves) of *Coffea arabica* “Catimor CIFC 7963” were cultured on Murashige and Skoog (MS) medium supplemented with 1  $\mu$ M 2,4-dichlorophenoxyacetic acid (2,4-D) + 5  $\mu$ M 6-benzlyaminopurine (BA). The treatments included the following rates of AC application: 0.008%, 0.08%, 0.1%, and 1% (w/v). We also evaluated the effects of growth in MS medium supplemented with 1  $\mu$ M 2,4-D + 5  $\mu$ M BA + 10 mM picloram vs. 10 mM picloram as the sole plant growth regulator. The results showed that cells of the 1<sup>st</sup> leaves on MS medium + 1  $\mu$ M 2,4-D + 5  $\mu$ M BA + 0.008% AC were induced to callus (46.88% callus induction). In addition, callus induction (90.63% and 59.38%) was observed in the leaves cultured on MS medium + 1  $\mu$ M 2,4-D + 5  $\mu$ M BA + 10 mM picloram and on MS medium+10 mM picloram, respectively. However, the 4-month-old friable calli developed on MS medium containing picloram showed mitotic aberrations. Some of these included binucleated cells, a micronucleus in binucleated cells, and vagrant chromosome cells. These results highlight that both 0.008% AC and 10 mM picloram were able to induce the development of 4-month-old friable callus in a high proportion of *C. arabica* “Catimor CIFC 7963” cells, but while the former produced no mitotic aberrations, the latter induced mitotic aberrations in cells.*

**Keywords:** *Coffea arabica*, Mitotic aberration, Friable callus, Picloram, Activated charcoal