

# Plant Genomics

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## Studies on nutrient uptake and culture conditions for synthesis of caffeine, (+)-catechine, (-)-epicatechin and (-)-epigallocatechin gallate in anther derived haploid cell lines of tea *Camellia sinensis* L

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Tea is a perennial, evergreen tree of the family Theaceae. It is most consumable non-alcoholic caffeine containing beverage in the world due to its pleasant taste, attractive aroma and its medicinal property. Tea contains large amount of catechins (a group of very active flavonoids) which have anticancer, antidiabetic, antiviral, antimalarial, hepatoprotective, neuroprotective and cardio protective effects. Present study aims to study batch kinetics of androgenic haploid cell lines established from pollen grains in anther cultures of TV21 cultivar of tea. The haploid status of these cell lines were confirmed by flow cytometry. Cell suspension cultures were raised from fresh friable and high proliferating calli established on semi-solid medium. Dynamic changes of parameters, such as pH, fresh and dry cell concentrations, consumption of major nutrients, carbon source and agitation speeds, were studied to understand the culture characteristics. Maximum viable cultures were obtained at a rotation speed of 120 rpm. Identification and quantification of caffeine, (+)-catechine, (-)-epicatechin and (-)-epigallocatechin gallate were performed by HPLC which were further confirmed through mass spectrometric data analysis. Maximum yield of 2.7% caffeine, 0.26 % (+)-catechin, 0.92% (-)-epicatechin and 10.36% (-)-epigallocatechin gallate per gram dry weight was obtained from cells in suspension culture at 24th day. Compare to this, leaves from parent plant produced 3.14% caffeine, 0.48 % (+)-catechin, 1.3% (-)-epicatechin and 11.3% (-)-epigallocatechin gallate per gram dry weight which was marginally higher. The optimized conditions and parameters of the present study would be useful for further scale-up process by using suitable elicitors/precursors.

### Biography

Rakhi Chaturvedi is the Professor at Biosciences and Bioengineering (BSBE) Department, IIT Guwahati, Guwahati. She has obtained her Bachelor's and Master's degrees from University of Allahabad, Uttar Pradesh, India. Subsequently, she has received MPhil and PhD degrees from University of Delhi, India in 1996 and 2001, respectively. After completing her Postdoctoral studies from Jawaharlal Nehru University, she has joined IIT Guwahati in the year 2004 as an Assistant Professor in the Department of BSBE. She has held important academic and administrative positions. She has served as Vice-Chairperson GATE-JAM 2013, Chairperson GATE-JAM 2014, Chairperson GATE-2015 and Organizing Chairperson JAM-2015 examinations. Currently, she is the Associate Dean of Alumni Affairs and External Relations at IIT Guwahati.

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