

## 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 24<sup>th</sup> 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 Associate Professor at Department of Biotechnology, IIT Guwahati. She has been awarded 'Prof Y.S. Murty Medal 2011' by Indian Botanical Society and Overseas Travel award from DST and INSA New Delhi, India. She is member of National Academy of Sciences, India and the Associate Editor of Springer journal "In Vitro Cellular and Developmental Biology- Plant". Besides, she is member of many prestigious academic societies such as, Society for In vitro Biology (SIVB), USA, Society of Biological Chemists, India (SBCI), The Biotech Research Society (BRSI), India, Indian Botanical Society (IBS). She has published 7 book chapters, >36 conference proceedings and over 30 publications international journals of high impact factors like, Biotechnology Advances with impact factor of 7.6, Bioprocess Biosys Eng, Industrial Crops Products, In Vitro-Plant, Biotechnology Bioprocess Eng, Biol Plantarum, Plant Cell Rep, J Plant Physiology, Plant Cell Tissue Organ Cult, Plant Sci etc. She has guided more than 16 B.Tech., M.Tech, and Ph.D. students and received research funding worth over 1.5 Crore from and DST, India.

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