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Cell proliferative activity on human umbilical cord-derived mesenchymal stem cells by water extract of *Camellia sinensis* grown in Sabaragamuwa Province, Sri Lanka

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Human umbilical cord-derived mesenchymal stem cells have the capacity of self–renewal, repair of damaged tissues and ability to differentiate into many cell types *in-vivo.* Therefore, the properties of mesenchymal stem cells are considered as a cutting edge tool in regenerative medicine applications. Recent research studies have revealed that naturally occurring bioactive compounds present in plants have the ability to increase the self-renewability of stem cells and cell growth, and to regulate differentiation into more defined cells through activation of different cell signaling pathways. In this study, the effect of *Camellia sinensis* (tea) water extracton Human umbilical cord-derived mesenchymal stem cell proliferation *invitro* was investigated.Fresh tea flush (TF) and tea buds (TB) were collected (February, 2017) from mature plants of the clone TRI2023 grown in different areas of the Sabaragamuwa Province (Eheliyagoda, Gilimale, and Ratnapura). Cell proliferative potential was evaluated for tea samples, Epicatechin (EC), Epigallocatechin gallate (EGCG), and Gallic acid (GA) for the concentration 25 µg/ml, by 3-(4,5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) assay, after 72 hour treatment (n=3). Morphological features of cells were observed using an inverted fluorescence microscope. The TF and TB collected from Eheliyagoda showed highest cell proliferative activity by over 149% and 140%, respectively. Ratnapura TF, TB and Gilimale TF stimulated cell proliferation closer to 100%, while Gilimale TB increased by 130%. However, the EC showed the highest cell proliferation compared to EGCG, GA, and tea samples. A percentage of 28.9 ± 1.8% cytotoxic value was shown for the positive control at a concentration of 25 mM. No morphological changes in differentiation were observed over 72 hours of exposure. These findings suggested that bioactive compounds present in tea extracts enhanced the proliferation of mesenchymal stem cells.

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