

## **Solvent and supercritical fluid extraction of catechin from *Camellia Sinensis* (tea) leaves for utilization as functional food ingredient**

### **ABSTRACT**

Supercritical fluid and solvent extraction of catechin from green tea (*Camellia sinensis*) leaves was studied. Response surface methodology was used to design the experiment and optimize the operating variables (pressure, temperature and dynamic time). The optimum recovery of the extractable crude yield (6.65%), TPC (28.07g/100gGAE), EGCG (263.06mg/100ml), and total catechin (844.25mg/100ml) were obtained at pressure (30Mpa), temperature (47.99oC and dynamic time (40 minutes) with a co-solvent (50% v/v water :ethanol) and CO<sub>2</sub> flow rates of 1,5 and 1.0ml/ minute respectively. When organic solvent was used, the extractable components were in the range of: total crude extract (2.05 -3.57%), TPC (153.22 -94.95g/(100gGAE), and TC (285.27mg/100ml) respectively. (With methanol 70 % (v/v), ethanol 50% (v/v), and ethanol 70% (v/v) being the most effective in term of extracts. The result of the extracts obtained by SFE extraction when compared to that of solvent shows that SFE was more effective in the recovery of catechin polyphenols from green tea leaves. By comparing conventional solvent and SFE extraction we were able to identify the abundance of green tea polyphenol from Malaysia which can compete favourably with those obtained from other tea producing countries. The knowledge can be useful to functional food manufacturers.

**Keyword:** Extraction; Supercritical Fluid extraction (SFE); Solvent extraction; Green tea catechin and functional food