

# The Comparative Study of Different Novel Extraction Techniques to Green Tea Bioactive Compounds

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## Outline

### 1. Introduction

A. Optimization of Sequential Supercritical Fluid Extraction (SFE) of Caffeine and Catechins from Green Tea.

B. A Comparative Study of Ultra-sonication and Agitation Extraction Techniques on Bioactive Metabolites of Green Tea Extract.

### 2. Conclusion

## Abstract

Green tea (*Camellia sinensis*) is one of the most popular beverage around the world. Most compounds in tea extracts are caffeine and catechins, both of which provide the benefits to human body and are considered as the material of pharmaceutical industry. Supercritical fluid extraction (SFE) is a suitable method to extract caffeine and catechins due to its several advantages as eco-friendly and non-toxic. The study indicated that using two-steps sequential SFE can obtain both caffeine and catechins respectively that were used to separate with organic solvent in the past. The caffeine would be obtained in first extraction under the condition of 25 MPa at 60°C for 3 h. The second extraction would obtain high purity catechins under the same condition by adding ethanol as a modifier at a flow rate 0.5 mL/min. Ultra-sonication extraction (UE) and agitation extraction (AE) are the novel extraction techniques which exhibit a higher extraction yield. Compared to SFE, UE and AE have a better extraction efficiency on higher polar compounds such as vitamin C and total amino acids. UE and AE on 80°C for 20 min resulted in higher extracts in caffeine, catechins, total amino acid, total polyphenols and total flavonoids content, and also exhibited the highest anti-oxidation capacity.

1 Das, P. R., & Eun, J. B. (2018). A comparative study of ultra-sonication and agitation  
2 extraction techniques on bioactive metabolites of green tea extract. *Food*  
3 *Chemistry*, 253, 22-29.

4 Sökmen, M., Demir, E., & Alomar, S. Y. (2018). Optimization of sequential  
5 supercritical fluid extraction (SFE) of caffeine and catechins from green tea.  
6 *The Journal of Supercritical Fluids*, 133, 171-176.

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