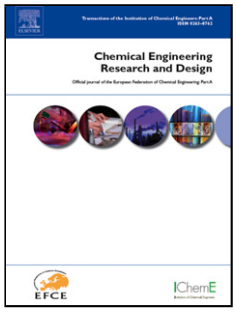


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Highlights:

1. PEF as a novel technology for disclosure of valuable components from biomass;
2. Major components of interest, polyphenols are extracted in large amounts;
3. Detailed study of mechanisms occuring electroporation of the cells.

# Polyphenol extraction from fresh tea leaves by pulsed electric field: A study of mechanisms

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ABSTRACT

*The major interest in pulsed electric field treatment of biological tissues is derived from its non-thermal application: increasing cell permeability. This application has an important implication in extraction of complex organic molecules. In this work, pulsed electric field treatment is investigated as a mild (non-thermal) processing method for opening the cell structure in fresh tea leaves. Pulsed electric field utilizes short-duration high-voltage pulses for opening the cell structure by the process called electroporation. Upon the treatment subsequent extraction of complex organic molecules, particularly polyphenols occurs. The amount of extracted polyphenols (in this case the extraction yield) has been determined as a function of electric field strength, duration and number of applied pulses, as well as energy input per unit of mass of the sample. The results indicate that the used conditions during the treatment increase in temperature didnot exceed 10 $^{o}$C. This limited temperature rise provides a valid evidence that pulsed electric field processing is a non-thermal method applied under used conditions.*