

Heat enhances total polyphenol, total flavonoid, antioxidant activity and kaempferol production in *Hibiscus cannabinus* L leaf.

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실험목적 (Objectives)

The objective was to find the optimum temperature for maximum polyphenol and flavonoid content, antioxidant activity and quercetin (aglycone) production using the far infrared drying (FIRD) and oven drying (OD) methods in a comparative way. To determine, if heat has a toxic effect on onions, cytotoxic activity was also evaluated in macrophage cells. Kenaf leaf powder sample was exposed in far infrared Irradiation (FIRD) and the oven drier (OD) to evaluate the effect of heat on Kaempferol production and alteration in total polyphenol, total flavonoid and antioxidant (DPPH free radical scavenging, reducing power, total antioxidant capacity) activity.

재료 및 방법 (Materials and Methods)

Sample preparation: Kenaf leaf was exposed in Far infrared irradiation (FIR) and Oven Drier (OD) at different temperature.

1. Estimation of total polyphenol and Total flavonoid content.

Antioxidant assay

- a. DPPH free radical scavenging activity,
- b. Reducing power assay,
- d. Nitric oxide scavenging activity,

e. Cytotoxicity evaluation.

HPLC quantification of Kaempferol (aglycone)

실험결과 (Results)

The HPLC result revealed that the Kaempferol production increased (7.437 mg/g dw) significantly at the temperature of 80°C in FIRD exposed samples. Likewise, sample exposed in OD at 180°C also increased kaempferol (7.84 mg/g dw) compared to that of control (0.106 mg/g dw). The sample exposed at 80°C in FIRD significantly increased polyphenols (51.368±2.53 mg/g dw) and flavonoid (22.243±0.43 mg/g) in the kenaf. Similarly, the highest polyphenol and flavonoid content were identified at 170°C and 180°C in the OD exposed samples with 53.480±1.14 mg/g and 19.613±0.30mg/g respectively. The antioxidant (DPPH free radical scavenging, reducing power and total antioxidant capacity) property was increased with increase in temperature and exposure time up to a certain limit in both FIRD and OD. Further, treated kenaf extracts scavenged 78.66±1.65% at 1mg/mlNO production in a dose-dependent manner compared to the control (46.05±1.51 %) without cytotoxic effects.

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Fig. Graphical representation of Total polyphenol (A) and Total Flavonoid (B) content in untreated and heat (FIR and OD) treated Kenaf leaf ^{4,5}

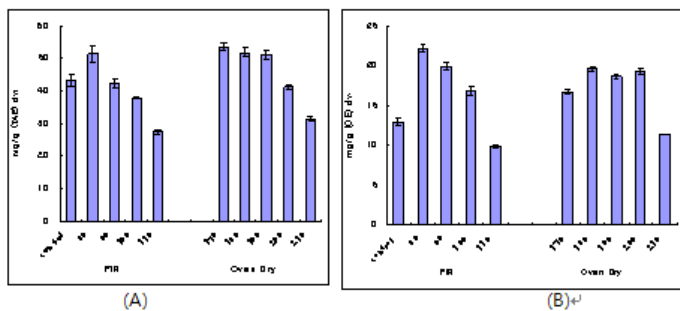


Table. Kaempferitrin and Kaempferol content in different drying conditions.

SAMPLE	OVEN TREATMENT	
	Kaempferitrin content (mg/g dw)	Kaempferol content (mg/g dw)
control	39.566	0.106
OD 170°C	23.227	2.126
OD 180°C	17.504	7.84
OD 190°C	5.503	3.64
OD 200°C	1.489	4.508
OD 210°C	1.34	2.92
FIR TREATMENT		
FIR 80°C	27.519	7.437
FIR 90°C	8.532	7.217
FIR 100°C	1.542	5.263
FIR 110°C	0.371	2.354

