

**LEMBAR**  
**HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW**  
**KARYA ILMIAH : PROSIDING INTERNASIONAL**

Judul Karya Ilmiah/Artikel : The differences of using electrical and mechanical oven to the quality characteristics of liquid smoked milkfish (chanos chanos forks)

Jumlah Penulis : 3(tiga)

Status Pengusul : Penulis pertama/ ~~penulis ke-2/ penulis korespondensi\*~~

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## Welcome to IPCBEE



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## Keynote Speaker

<b>Keynote Speaker I</b> Prof. James T. Anderson  West Virginia University, USA The title of his presentation is “Assessing Functional Equivalency in Created Wetlands”.	
<b>Keynote Speaker II</b> Prof. Khalil HANNA  Université Européenne de Bretagne, France The title of his presentation is "Use and implications of iron species in environmental remediation processes".	

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## Antioxidant and Nitrite Scavenging Ability of Mugwort Extracted with Different Solvents

Ko Eun Hwang <sup>1+</sup>, Dong Heon Song <sup>1</sup>, Sung Jin Jang <sup>1</sup>, and Cheon Jei Kim <sup>1</sup>

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**Abstract.** This study was conducted to investigate the physiological activity of mugwort (*Artemisia princeps* Pamp.) extracts from five different solvents (ethanol, ethyl acetate, methanol, water, and hot water). The highest total phenolic contents (82.75 mg/g) and total flavonoid contents (22.53 mg/g) found in water extracts. Also, the water extracts had the higher ferrous chelating activity (63.63%), and nitrite scavenging ability (80.06%) and the smaller IC<sub>50</sub> values in ferrous iron metal chelating activity, nitrite scavenging ability, and DPPH radical scavenging activity (0.89 mg/mL, 0.39 mg/mL, and 0.14 mg/mL, respectively) than other solvent extracts. As the above results, physiological activity in water extracts of mugwort is promising source of functional food ingredients.

**Keywords:** mugwort, antioxidant activity, nitrite scavenging ability

### 1. Introduction

Recently, consumer demands for functional and safe food, if possible free of conventional chemical substances. Because of concerns about the toxicological safety of artificial additives, the use of natural preservatives has increased considerably in the last few decades. The application of the natural ingredients are a promising technology since many plants, herb, spice and vegetables substances have antioxidant and antimicrobial properties and low toxicity compared with those of synthetic phenolics antioxidant such as BHT (butylated hydroxytoluene), BHA (butylated hydroxyanisole), and propyl gallate [1]. Among natural antioxidants, mugwort (*Artemisia princeps* Pamp.), commonly known as medicinal herb, is a perennial plant widely distributed in Japan, Korea, China and Europe. In Oriental countries, including Korea, mugwort is widely used as a food or food additive. This plant contains bioactive compounds, such as phenolics, vitamins A, B<sub>1</sub>, B<sub>2</sub> and C as well as various minerals [1]. In recent scientific literature, mugwort has been reported to have anti-atherosclerotic, anti-inflammatory, anti-scratching behavioral, anti-bacterial, and radical scavenging [2]. However, no previous study has examined the effect of the different solvents from mugwort on antioxidant and nitrite scavenging ability. Therefore, the aim of this study was to evaluate the physiological activity of different solvents (ethanol, ethyl acetate, methanol, water and hot water) from mugwort on total phenolic contents, total flavonoid contents, ferrous iron chelating activity, nitrite scavenging ability, and DPPH radical scavenging activity.

### 2. Material and Methods

#### 2.1. Preparation of extracts

Commercial samples of dried mugwort were purchased from a local market. After separating the leaves from the dried mugwort, they were ground using a blender for 1 min. Ground mugwort leaves (10 g) were extracted with 200 mL of ethanol, ethyl acetate, methanol and distilled water overnight (24 h) in a shaker at room temperature and the hot water extraction of mugwort was prepared ground leaves (10 g) extracted in 20

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## Rare Earth Elements Determination in Rocky Shore Gastropod *Thais clavigera*

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**Abstract.** Interspatial and inter-tissue variations of rare earth elements (REEs) in *Thais clavigera* collected from particular sites along the east coast of Peninsular Malaysia, Malaysia were studied. All REEs yielded significant strong positive correlation ( $p < 0.05$ ,  $p < 0.01$ ) among each element in soft tissue and operculum, with some variations in shell. The typical REEs fractionation patterns normalized to chondrite were remarkably similar indicating a common source of the REEs for the whole east coast region. Identical deviations from this pattern were found for Eu and could be explained by their redox chemistry. The ratio of light to heavy REEs, La/Yb in the *T. clavigera* of 29.47 are remarkably similar to Terengganu River basin soil of 33.00 and Terengganu River sediment of 27.60. Consistent chondrite-normalized patterns suggested that light REEs and heavy REEs fractionation in coastline marine environment produces more light REEs and less heavy REEs.

**Keywords:** east coast peninsular Malaysia, rare earth elements, rocky shore, chondrite normalization

### 1. Introduction

REEs is a coherent group of elements whose chemical properties transform steadily and consequently being employed as a tool for exploring paleoclimatic environment, origin, erosion activities and soil-water connections [1]-[2]. REEs were initially isolated in the 18<sup>th</sup> and 19<sup>th</sup> centuries as oxides from rare minerals. In recent years, enrichments caused by anthropogenic factor have been increasing due to the growing uses and applications in various types of industries, resulting in contamination of mainly the aquatic environment [3]. REEs are used in enormous magnitudes in the mechanized of industrial goods including lasers, computers, pigments for glass and plastics, and additives [4]. REEs incline to be accumulated by biota and have contaminated consequences similar to those of heavy metals.

All aquatic invertebrates gather trace elements in their tissues, whether or not these elements are required to metabolism [5]. With admiration to REEs, no established biological functions have been described and thus these elements are considered as non-essential in biota. The soft tissues of marine molluscs are generally recognized as more efficient accumulators of metals than shells [6]. But recent studies have evidently used shell as one of the useful biomonitoring component of the molluscs on recording the environmental pollution. Shells also have some practical advantages over the use of soft tissue as they can reveal less variability, integrate metal concentrations over the life of the organisms, able to give an idea of the metal levels in the past and offer considerable advantages in easy preservation and storage [7].

The genus *Thais* is common in the intertidal rocky shores of Peninsular Malaysia [8]. Capability of *T. clavigera* to accumulate heavy metals and suitable as good bioindicator have been well discussed by several studies [9]-[11]. The objectives of this study are to provide an insight on interspatial and inter-tissue

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## Recent Bio-utilization of *Jatropha Curcas* Seed

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**Abstract.** *Jatropha curcas* plant is widely cultivated in many areas in Thailand as it has seeds with high quality of oil. Its seed oil has been extracted and used as an alternative fuel to solve an energy shortage in the country. After oil extraction, the seed cake is a low-cost and under-utilized by-product with a high amount of protein. Unfortunately, protein-rich seed cake cannot be applied to human food or animal feed since it has toxic compounds, phorbol esters, and anti-nutritional factors such as phytate, trypsin inhibitor, lectin and saponin. Therefore, the detoxification of these toxins is necessary for the seed cake utilization. Recently, researches on the utilization of the under-utilized seed cake are under progress. This paper aims to review the recent research works on the utilization of the seed cake including removal of toxins in the seed cake by microbial fermentation and production of bioactive compounds expressing anti-oxidative, anti-hypertensive and plant growth promoting activities.

**Keywords:** *jatropha curcas*, detoxification, protein hydrolysis, anti-oxidation, anti-hypertension, plant growth promotion.

### 1. Introduction

At present, the insufficiency of energy resources due to the high demand for transportation and industrial uses leads to global energy crisis. The supplementary and alternative energy sources are urgent needs. In Thailand, the fuel consumption rate continuously increases by approximately 4.5% each year [1]. Currently, *Jatropha curcas* is an interesting energy source for biofuel production. It has been cultivated around the country with the supports of Thai government. It is also easily cultivated under climatic conditions of Thailand. Its seeds are extracted for oil and processed to become the biofuel. After oil extraction, seed cake is a non-valuable by-product which is normally used as a green manure or a fertilizer [1].

*J. curcas* is a tropical short-lived plant in the Euphorbiaceae family, which can be cultured in Central and South America, South-East Asia, India and Africa [2]. It is a multipurpose small tree because of industrial and medicinal uses [3]. It is well adapted to arid and semi-arid conditions and often used for prevention of soil erosion [2]. Within 3-4 months after flowering, *J. curcas* mature seeds can be harvested from the ripen fruits [3]. A fruit contains 3 triangular-convex ellipsoid seeds which have 300-350 g/kg oil [3], [4]. Its seed oils are widely used as a fuel substituent, after trans-esterification. After oil extraction by a screw press, there are 500-600 g/kg indigestible seed cakes left which contain a high amount of proteins, approximately 190-270 g/kg [5]. The seed cake has been utilized as a fertilizer or a green manure. Proteins in the seed cake consist of all essential amino acids, except for lysine, which are higher than FAO and WHO reference proteins for 2-5 year old children as shown in Table 1 [2]. However, the application of its seed cake protein in animal feed industry is restricted since there are toxic compounds; phorbol esters, and anti-nutritional factors such as trypsin inhibitor, phytic acid, lectin and saponin, which cause the negatively effects to humans and animals [6]-[11]. The detoxification of those toxic compounds is important for seed cake protein application either as food or feed ingredients and it is a good way to add the value to this under-utilized by-product.

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# Application of a New Topographic Index Considering Soil Properties to Simulate Rainfall Runoff Process in Arid and Semi-Arid Region of Northwestern China

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**Abstract.** In order to improve the performance of rainfall runoff process simulation with hydrological model, and acquire more scientific support for water resource management in arid and semi-arid region of northwestern China, the classic topographic index  $\ln(\alpha/\tan\beta)$  (TI) and a newly proposed topographic index  $\ln(\alpha/(\tan\beta K_s K))$  (TI') considered soil hydraulic and physical properties, were respectively applied to simulate the daily and monthly rainfall runoff process from 1995 to 2000 in Yingluoxia watershed, with land surface hydrological processes model TOPX. TI and TI' were calculated by the algorithm of IMFD and the revised IMFD which considered soil properties, during the calculation, DEM and soil character data with grid form were required. In addition to the average value of topographic index, precipitation and evapotranspiration, with 600×600m resolution, were collected to drive TOPX model. Nash-Sutcliffe coefficient (NSE), correlation coefficient (R) and relative error (RE) were used to access the model performance of rainfall runoff process simulation based on TI and TI', the evaluations suggested that, comparing with the model performance based on TI, the performance based on TI' were improved, the NSE of simulated daily and monthly streamflow were increased by 0.071 and 0.047 respectively, the R were increased by 0.040 and 0.022 respectively, the RE were changed from -0.039 to 0.002. This indicated that the new topographic index TI' could improve the performance of rainfall runoff simulation with hydrological model TOPX in arid and semi-arid region of northwestern China.

**Keywords:** rainfall runoff process, new topographic index, TOPX, arid and semi-arid region

## 1. Introduction

Due to the fast social development, over-population, typical arid and semi-arid climatic and hydrological characteristics in the northwestern China, people in this region have suffered a big gap between the great water demand and short water resources. It was reported that the average water diversion rate in this area had increased to more than 60% in 2008 which was much higher than the international reference warning value 50% [1]. Such big gap has seriously affected the natural water cycle balance in the region, and renders the water resource management much more difficult. In order to strengthen the water resource management and alleviate water shortage in the northwestern China, relevant investigations on various aspects of hydrology and water resources in this region have been carried out in recent decades [2]-[5], but the investigators mostly focus on the characteristic and change tendency of water cycle, the physical mechanism of hydrological process is relatively insufficient considered [1]. In that case, Yi [6] proposed a new topographic index  $\ln(\alpha/(\tan\beta K_s K))$  (TI') by adding the saturated hydraulic conductivity  $K_s$  and the soil erodibility factor  $K$  to the classic topographic index TI, which is an important concept to reflect the topographic controlling on hydrological process in some hydrological models [7], to study the impact of soil properties on hydrological process. This paper aims to apply the newly proposed TI' and the classic TI to a grid-based land surface

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## The Differences of Using Electrical and Mechanical Oven to the Quality Characteristics of Liquid Smoked Milkfish (*Chanos chanos* Forsk)

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**Abstract.** This research was aimed to find out the effects of using electrical (A<sub>1</sub>) and mechanical oven (A<sub>2</sub>) to the quality of liquid smoked milkfish in terms of moisture content, TMA, PV, TVB and TBA value. All bones of fish were removed prior dipped for about 15 minutes into 5% of coconut shell liquid smoke; then divided into two groups. One group was dried by using an electrical oven and the other was using a mechanical oven within  $\pm 80^{\circ}\text{C}$  temperature for about 3 hours. The results of T-Test data showed that the differences in drying methods gave some quality differentiation of liquid smoked milkfish ( $P < 0,05$ ). The moisture content of A<sub>1</sub> sample was found  $55.29\% \pm 0.38$  whereas A<sub>2</sub> sample was  $51.80 \pm 0.52$ . In terms of TMA content, A<sub>1</sub> sample was found  $56.91 \text{ mg nitrogen}/100 \text{ gr} \pm 0.23$ ; and A<sub>2</sub> sample was  $55.23 \text{ mg nitrogen}/100\text{g} \pm 0.45$ . PV; TVB; and TBA value of both samples (A<sub>1</sub> and A<sub>2</sub>) were found  $1.95 \text{ mlec/kg} \pm 0.034$  and  $2.01 \text{ mlec/kg} \pm 0.06$ ;  $100.79 \text{ mgNH}_3/100\text{g} \pm 1.06$  and  $118.56 \text{ mgNH}_3/100\text{g} \pm 2.67$ ;  $2.38 \text{ mg malonaldehyd}/100\text{g} \pm 0.02$  and  $4.02 \text{ mg malonaldehyd}/100\text{g} \pm 0.006$  respectively. Generally smoked fish processed with an electrical oven is better than a mechanical oven due to quality characteristics changes controlling during smoking.

**Keywords:** boneless smoked milkfish, electrical oven, mechanical oven, quality

## 1. Introduction

Smoking method using liquid smoke has already being implemented in Indonesia, as it could produce a high quality product and the processes are safer. Liquid smoke is considered as a substitute to traditional smoking method and could give strong flavour and colour to the products [1], [2]. Smoking is an old method that plays an important role in case of quality characteristics changes; it usually done by three processes; salting, deposition of smoke components (smoking) and drying. Some woods smokes contain many different components such as aldehydes, ketones, alcohols, acids, hydrocarbons, esters, and phenols. Phenolic compound and its derivatives play an important role as food antioxidants [3], [4]. Corn cob liquid smoke was used to the smoking process of milkfish to inhibit the growth of pathogenic bacteria which cause a lipid oxidation [5], [6]. Smoked Milkfish (*Chanoschanos*Forsk) contains a high nutrition value and has a specific taste, and it is highly acceptable by Indonesian people [7]. Trimethylamine; Peroxide value; total volatile base; and thiobarbituric acids are the most common parameters used to determine lipid oxidation [8], [9], and [6]

## 2. Materials and Methods

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