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Correlated factors with serum zinc levels of infertile male farmers in Larangan district, Indonesia

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Volume 6, Issue 5

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Review

Pomegranate (*Punica granatum* L.) fruits in the Quranic Hermeneutics and scientific perspectives

Atabik, A., Muqtada, M.R., Suhadi, Irnawati and Rohman, A.

Available Online: 4 SEPTEMBER 2022 I https://doi.org/10.26656/fr.2017.6(5).504

Atabik *et al*. reviewed pomegranate (*Punica granatum* L.) fruits in the Quranic Hermeneutics and scientific perspectives.

Effects of frying on fish, fish products and frying oil – a review

NurSyahirah, S. and Rozzamri, A.

Available Online: 4 SEPTEMBER 2022 I https://doi.org/10.26656/fr.2017.6(5).608

The effects of frying on fish, fish products and frying oil were reviewed by NurSyahirah and Rozzamri.

Mini Review

A review on fish sauce processing, free amino acids and peptides with sensory properties

Hakimi, S., Ismail, M.N., Ayub, M.N.A. and Ahmad, F.

Available Online: 31 AUGUST 2022 I https://doi.org/10.26656/fr.2017.6(5).562

Hakimi *et al*. reviewed the processing of fish sauce, free amino acids and peptides with sensory properties.

Full Papers

Association of mothers' child feeding knowledge, attitude, and practices with nutritional status of children under the age of five in a Malaysian fishing community: a cross-sectional study

Zakaria, N.S., Asma', A., Zakaria, N.S., Abd Wahab, M.R., Lani, M.N. and Meli, A.M.

Available Online: 4 SEPTEMBER 2022 I https://doi.org/10.26656/fr.2017.6(5).640

Zakaria *et al.* studied on the association of mothers' child feeding knowledge, attitude, and practices with nutritional status of children under the age of five in a Malaysian fishing community.

Effect of viscosity on iron encapsulation using alginate as a carrying agent in a controlled spray drying process

Permanadewi, I., Kumoro, A.C., Wardhani, D.H. and Aryanti, N.

Available Online: 9 SEPTEMBER 2022 I https://doi.org/10.26656/fr.2017.6(5).613

Permanadewi *et al.* studied the effect of viscosity on iron encapsulation using alginate as a carrying agent in a controlled spray drying process.

Chemical and microbial changes of stingray fish (*Trygon sephen*) during soaking in salt solution before smoking process

Suprapto, H., Kumalaningsih, S., Wignyanto, W., Santoso, I. and Sucipto, S.

Available Online: 9 SEPTEMBER 2022 I https://doi.org/10.26656/fr.2017.6(5).445

The chemical and microbial changes of stingray fish (*Trygon sephe*n) during soaking in salt solution before smoking process were studied by Suprapto *et al.*

Characteristics of chikuwa with the addition of liquid smoke as an antibacterial agent

Swastawati, F., Agustini, T.W., Riyadi, P.H., Purnamayati, L., Prasetyo, D.Y.B., Setiaputri, A.A. and Sholehah, D.F.

Available Online: 9 SEPTEMBER 2022 I https://doi.org/10.26656/fr.2017.6(5).544

Swastawati *et al.* evaluated the characteristics of chikuwa with the addition of liquid smoke as an antibacterial agent.

Physicochemical, functional and sensory properties of wheat noodles substituted by sorghum and mung bean flours

Wahjuningsih, S.B., Azkia, M.N. and Kusumaningtyas, R.W.

Available Online: 9 SEPTEMBER 2022 I https://doi.org/10.26656/fr.2017.6(5).604

The physicochemical, functional and sensory properties of wheat noodles substituted with sorghum and mung bean flours were evaluated by Wahjuningsih *et al.*

Correlated factors with serum zinc levels of infertile male farmers in Larangan district, Indonesia

Winarni, S., Suwondo, A., Kartini, A., Susanto, H., Dharminto, Mawarni, A., Kujariningrum, O.B. and

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MINI REVIEW

A review on fish sauce processing, free amino acids and peptides with sensory properties

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Abstract

Fish sauce is a well-known condiment for its delicious flavour developed through a fermentation process. It is generally used as an additive for flavour enhancement in cooking. The fish sauce comes in several appearances, ranging from a clear liquid with light colour and texture to a dark and cloudy liquid. This product is produced by a long-duration of fermentation process by the combination of fish and salt. This high salt fermentation began with the action of enzymes from fish muscle and its digestive tracts, then continued with halophilic bacteria activity to further break down fish proteins in producing a liquid product with a mixture of soluble proteins, peptides and amino acids. This review is comprised of two sections, the first section covers various processing methods of fish sauces, mainly in the Asia region, namely *Nam-pla, Nuoc-mam, Yu-lu, Ishiru, Shottsuru, Bakasang* and *Budu*. These fish sauces roughly involve applying salt for fermentation, with different fish species, salt concentration, fermentation duration and processing techniques. The later section covers taste-contributing components of fish sauces in the scope of amino acids and peptides. Five of the major amino acids found to taste in the fish sauce, glutamic acid, threonine, alanine, methionine and histidine, are also reviewed in this paper. Sensory peptides in fish sauces shown in this paper are peptides with salt taste enhancement properties and peptides exhibiting sweet, sour, bitter, umami and kokumi tastes.

1. Introduction

Fish sauce is a brown to grey liquid with a unique aroma and flavour produced as the end product of fish fermentation. It is commonly used as a flavouring additive in cooking and often consumed as a condiment in daily meals (Saisithi, 1994; Rosma *et al*., 2009; Montero *et al*., 2017). There has been a record of fish sauce consumption during the Roman and Athenian eras during the fifth century, namely *Garum* (Skara *et al*., 2015; Aquerreta, Astiasarn, and Bello, 2002) as well as in ancient Greece, *Aimeteon* (Ishige, 1993). *Garum* was produced by the activity of halotolerant enzymes from the viscera of a fresh mackerel in breaking down its blood and its salted innards for roughly two and up to nine months. Meanwhile, *Aimeteon* was produced by the viscera and blood of tunny fish (Beddows *et al*., 1979; Beddows, 1998; Aquerreta *et al*., 2002; Nielsen, 2004). Nowadays, various fish sauce products are widely used worldwide, predominantly in Southeast Asia and some other parts of the globe (Adewumi, 2018).

Fish sauces are known by different names throughout different countries, such as *Nam-pla* (Thailand), *Bagoong* (Philippines), *Bakasang* (Indonesia), *Shottsuru* (Japan), Aekjot (Korea), *Yu-lu* (China), *Colombo cure* (India), *Ngapi* (Burma) and *Budu* (Malaysia) (Kuda and Miyawaki, 2010; Sim *et al*., 2015). These varieties of fish sauce products have different fish species used as the primary raw material, salt concentrations, storage temperatures, storage containers and processing techniques, resulting in a final product with unique characteristics of different smells, tastes and colours (Lopetcharat *et al*., 2007). Previous research has found that fish sauce contains a high

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FOOD RESEARCH

FULL PAPER

Application of *Phyllanthus emblica* extract in manufacturing pharmaceutical composition for repairing liver damage

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Abstract

The objective of this study was to prepare a medicinal formulation with the extract of *Phyllanthus emblica* to repair liver damage. The hepatocyte cell line Hep-G2 was used in the experiment. The experimental sample was prepared by adding 20,000 hepatocytes to each well of a 24-well Seahorse XF24 analyzer special cell culture plate and cultured for 24 hrs. Subsequently, the culture medium from each well was removed. The hepatocytes in the wells were processed according to the conditions of the experimental, control, or comparator group. The oxygen consumption of the hepatocytes in the experimental, control, and comparator groups in the wells of the cell culture plate was measured using the Seahorse XF24 analyzer bioenergy meter. Treating cells with hydrogen peroxide can simulate the intracellular oxidation of free radicals, permitting examination of the mitochondrial activity of cells under oxidative stress. The mitochondrial activity in the hepatocytes was maintained. The mitochondria produced a sufficient amount of adenosine triphosphate (ATP), allowing the hepatocytes to maintain their normal metabolic functions. Owing to the improved synthesis efficiency and capability of triphosphate required for cell damage repair, damaged hepatocytes were able to obtain adequate energy for repair. Thus, liver repair was accelerated, and it returned to its normal condition.

1. Introduction

The liver is one of the major metabolic organs in the body. The liver's work involves metabolizing sugars, proteins with lipids, and decomposing, converting and removing toxins from the body. However, free radicals are also produced as a by-product in the process of liver work, especially in the decomposition, conversion and elimination of toxins in the body. Furthermore, for the liver that is damaged by the disease, the amount of free radicals produced when the liver is working is also increased in the case where the function of the liver is affected by the disease (Malhi and Gores, 2008; Lobo *et al.*, 2010; Guicciardi *et al*., 2013). For hepatocytes, the free radicals have a strong oxidative force, making the contact with free radicals of liver cells and hepatocytes within the organ is greatly increased the chance of damage caused by oxidation. In particular, mitochondria are oxidized and phosphorylated into hepatocytes and synthesize adenosine triphosphate (ATP) (Degli Esposti *et al.*, 2012; Bergman and Ben-Shachar, 2016). When the mitochondria are damaged by oxidative damage caused by large amounts of free radicals, the liver cells are unable to obtain sufficient energy from the self-active mitochondria. In this way, the low activity of mitochondria will work on the liver cells and have a serious negative impact, and thus the liver function has a negative impact (Degli Esposti *et al.*, 2012; Mullebner *et al.*, 2015). This study provided the use of Emblica extract for the preparation of a pharmaceutical composition for repairing liver injury, thereby enhancing the activity of granulocytes in hepatocytes of the liver, thereby maintaining the normal function of liver cells and repairing liver damage (Chularojmontri *et al.*, 2013; Zhao *et al.*, 2016).

2. Materials and methods

2.1 Emblica extracts treatment method

In this study, the extraction of Emblica extract, using carbon dioxide in the supercritical fluid extraction of

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FOOD RESEARCH

FULL PAPER

Composition and bioactivity of essential oils from lolot pepper (*Piper lolot* C. DC.) extracted by microwave-assisted hydrodistillation

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Abstract

In this study, lolot pepper (*Piper lolot* C. DC.), a popular vegetable, a special spice, and effective medicine in Vietnam, was utilized for the extraction of essential oil. Chopped or grounded lolot leaves were hydro-distilled by microwaving supplemented with water levels (200 to 700 mL) in different extraction periods (30 to 120 mins) by different heating power levels (400 to 800 W). The chemical composition of the extract was analyzed by mass spectrometry gas chromatography. Then, the antibacterial and antioxidant properties of lolot essential oil were investigated. As a result, the suitable conditions for the extraction of essential oils of lolot pepper by microwaving were determined by utilizing the chopping raw material with 500 mL distilled water per 500 g of lolot pepper, through a 90-minute extraction at 800 W). The main components of the essential oils of the lolot pepper collected in Dong Thap province were 19 compounds, mainly (E)-nerolidol (18.43%), germacrene D (12.52%), β-elemene (6.7%), β-caryophyllene (4.14%), and α-selinene (4.1%). Lolot pepper essential oils had inhibitory effects on *Bacillus subtilis*, *Escherichia coli*, *Edwardsiella ictaluri*, and *Streptococcus pneumoniae*. In particular, this essential oil could significantly inhibit *E. ictaluri* and *S. pneumoniae*. The antioxidant ability of lolot pepper essential oils tested by the DPPH free radical inhibition activity indicated that the concentration of the essential oils for 50% DPPH inhibition was 16.79 µg/mL.

1. Introduction

The attraction to essential oils from natural aromatic plant materials has recently increased. Each extract has a unique aroma and fragrance that could improve relaxation, comfort, and pleasure. These distillates possessed many medicinal properties which can be applied to the production of medicine, and antimicrobial and antiviral agents (Vergis *et al*., 2015; Puškárová *et al.*, 2017; Tariq *et al*., 2019). The antibacterial activity of essential oils is effective at high vapour concentrations for a short time (Inouye *et al*., 2001). Essences possess numerous biological activities (antioxidant, anti-inflammatory, antimicrobial) required in the food and cosmetic industries, as well as in the human health field (Tongnuanchan and Benjakul, 2014; Ali *et al*., 2015; Dhifi *et al*., 2016; Aziz and Karboune, 2018; Bhavaniramya *et al*., 2019).

Microwave-assisted hydrodistillation combines microwave heating and dry distillation, performed at atmospheric pressure without adding any solvent. Previous studies illustrated that essential oil extracted by this method possesses higher amounts of valuable oxygenated compounds, and reduces costs, time, and energy by bypassing sample preparation and/or evaporation steps. Furthermore, this method produces extract with a higher concentration of active phenolic compounds compared to other techniques (Lucchesi *et al*., 2004; Chan *et al*., 2011; Thakker *et al*., 2016; Liu *et al*., 2016; Michel *et al*., 2011).

Vietnam is located in the tropical monsoon region where natural conditions are favourable for the formation and development of plants, especially high-value essential oil-bearing plants. Piper species are widely used in folk medicine to heal wounds and reduce swelling and skin irritation (Gardner, 2010). In the Mekong Delta, lolot pepper (*P. lolot*), a popular vegetable in Vietnam, is also a special spice and effective medicine. Lolot pepper leaves contribute positive health effects on exhibiting warmth and pain relief (Lau, 2017). Although lolot pepper is a good medicinal plant with many applications for treating disease, it is considered only as a cooking spice. Compared to many other medicinal plants, the

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FOOD RESEARCH

FULL PAPER

Effect of different fat levels and *Moringa oleifera* leaf meal inclusion on sensory attributes of chicken droëwors

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Abstract

Moringa oleifera Lam. is an innovative nutraceutical and nutritional plant for animal and human diets. The plant has potent essential nutrients such as vitamins and minerals, protein, and essential amino acids, with a relatively small quantity of antinutrients. Hence the increase of its use in medicinal remedies and traditional cuisines in many parts of the globe. This study aimed to investigate the effects of different fat levels and *Moringa oleifera* leaf meal (MOLM) inclusion on sensory attributes of chicken droëwors. A total of forty randomly selected consumers of different gender and age were used as the sensory panel. About 75% of lean chicken meat and 25% of chicken fat were used during droëwors preparation. The raw materials were divided into nine (9) treatments i.e., T1 (0% fat, 0% MOLM), T2 (0% fat, 0.25% MOLM), T3 (0% fat, 0.5% MOLM), T4 (10% fat, 0% MOLM), T5 (10% fat, 0.25% MOLM) T6 (10%, 0.5% MOLM), T7 (15% fat, 0% MOLM), T8 (15% fat, 0.25% MOLM) and T9 (15% fat, 0.5% MOLM). In terms of colour, when 0.5% MOLM was added consumers responded with low values, 6.74 and 6.14 in T3 and T9, respectively, compared to other treatments. The aroma scores in treatments that added no MOLM were significantly lower ($P < 0.05$) than in other treatments with MOLM added, however, no significant difference was found in other treatments. Regarding texture, the consumer's panel in the current study responded with lower values (T3 = 6.35, T6 = 6.74, T9 = 5.81 when 0.5% MOLM was added. Meat flavour was significantly increased ($P > 0.05$), where 0.25% MOLM was added. Overall preference score in chicken droëwors significantly increased ($P > 0.05$) by adding 0.5% of MOLM in all the treatments; consumers liked chicken droëwors when 0.5% of MOLM was added. Droëwors with MOLM had higher ($P > 0.05$). The inclusion of *Moringa oleifera* leaf meal in chicken droëwors significantly improved its sensory attributes.

1. Introduction

Droëwors are ready-to-eat dried salted sausages, commonly made using beef and game meat globally, and they are regarded as a snack by some consumers (Mukumbo *et al.*, 2018). However, nowadays, they can also be made using chicken meat. Chicken meat is one of the most significant protein sources worldwide and is mainly demanded by consumers because of its low production cost and outstanding nutritional quality (Candan and Aytunga, 2017). The current study focuses on making droëwors using chicken meat rather than other meat types because it is accepted worldwide since it is not expensive and has excellent nutritional value (Konieczka *et al.*, 2017). Even though chicken meat is known to have positive dietary attributes, it is also known to have high polyunsaturated fatty acids, making it difficult for it to be used in making droëwors because of the exposure to oxidation processing (Cortinas *et al.*, 2005). Food additives are often included in the processing of meat products to enhance the shelf-life and improve the product's sensory attributes (Hoffman *et al.*, 2014). Therefore, the present study focuses on the use of antioxidants to hinder the process of oxidation. Antioxidants are divided into natural and synthetic antioxidants (Wilson *et al.*, 2017). However, synthetic antioxidants are known to have carcinogenic effects.

Many authors recommend natural antioxidants rather than synthetic antioxidants due to their medicinal and

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DESCRIPTION OF ETHICAL APPROVAL
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Nama Institusi : Universitas Diponegoro
Name of the Institution

Anggota Peneliti : 1. Prof. Dr. dr. Hardhono Susanto, PAK (K)
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Dinyatakan layak etik sesuai 7 (tujuh) Standart WHO 2011, yaitu 1) Nilai Sosial, 2) Nilai Ilmiah, 3) Pemerataan Beban dan Manfaat, 4) Risiko, 5) Bujukan/Eksploitasi, 6) Kerahasiaan dan Privacy, dan 7) Persetujuan Setelah Penjelasan, yang merujuk pada Pedoman CIOMS 2016. Hal ini seperti yang ditunjukkan oleh terpenuhinya indikator setiap standar.

Declared to be ethically appropriate in accordance to 7 (seven) WHO 2011 Standards, 1) Social Values, 2) Scientific Values, 3) Equitable Assessment And Benefits, 4) Risks, 5) Persuasion/Exploitation, 6) Confidentiality and Privacy, and 7) Informed Concent, referring to the 2016 CIOMS Guidelines. This is as indicated by the fulfillment of the indicators of each standard.

Pernyataan Laik Etik ini berlaku selama kurun waktu tanggal 30 June 2020 sampai dengan tanggal 30 June 2021

This declaration of ethics applies during the period June, 30th 2020 until June, 30th 2021

Semarang, 30 June 2020
Professor and Chairperson,

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