

Utilization of the Fine Particles Obtained from Cold Pressed Vegetable Oils: A Case Study in Organic Rice Bran, Sunflower and Sesame Oils

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Abstract: Fine particles obtained from the physical refining of organic cold pressed vegetable oils which are normally discarded as a process waste can be utilized as cosmetic and food ingredients. This paper demonstrated the use of the fine particles from rice bran (Thai Jasmine and Riceberry varieties), sunflower and sesame oils as the ingredient in body mask and as dietary fiber. It was found that the fine particles from rice brans exhibited better antioxidant properties than those of sunflower and sesame. The mixed fine particles were added to body mask formula. The addition of the fine particles affected the physical properties and stability of the body mask especially viscosity and pH. Total dietary fiber recovered from the fine particles ranged from 17.91–23.83 g/100g dry sample. Dietary fiber from Riceberry exhibited the best antioxidant properties as evidenced by DPPH radical scavenging activity and reducing power.

Key words: crude oil, fine particle, fiber, physicochemical property, antioxidant property

1 Introduction

With increasing demand for natural and minimally processed foods, cold pressed vegetable oils have become more popular in the niche market. They are usually produced by small-scale manufacturers using a single screw compression press for oil extraction. The process is less capital intensive and requires no sophisticated machine. However, the production yield is low and the crude oils produced by the cold press method contain a high amount of impurities. The advantages of cold pressed vegetable oils over the industrial refined vegetable oils are their nutritional qualities and high level of physiological active compounds¹⁾.

Crude oils being extracted physically from the screw compression machine are subject to physical refining processes. Usually, the first step is to remove the fine particles using several techniques such as filter pressed machine, sedimentation or centrifugation. Depending on the facilities, the fine particles obtained from this step may be about 2-5%²⁾. The fine particles isolated from cold pressed vegetable oils are normally discarded as a process waste. With regards to the clean and green industry process, they could still be used for other purposes. The texture of fine particles is very smooth as they still contain some crude oils.

They can be used as cosmetic ingredients. The oils extracted from several plant species are popularly included as ingredients in cosmetic products due to their high fatty acid composition³⁾. In addition, when the oil is removed, the remaining residues could be used as a source of fiber ingredients. Their components should also contain a high amount of physiological active compounds as they have not been exposed to extreme heat or chemicals.

Fiber ingredients from natural sources are highly demanded in the food industry. Numerous studies have demonstrated the beneficial effects of fiber consumption in protection against heart disease and cancer, normalization of blood lipids, regulation of glucose absorption and insulin secretion and prevention of constipation and diverticular disease⁴⁻⁷⁾.

Therefore, this study aimed to evaluate the physicochemical and functional properties of the fine particles extracted from the organic cold pressed vegetable oils (rice bran oils from Thai Jasmine rice and Riceberry, sunflower and sesame oils). The utilization cases in this paper are divided into both non-food (cosmetic product) and food (dietary fiber) applications.

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