

Physico-chemical Characteristics of Papaya (*Carica papaya* L.) Seed Oil of the Hong Kong/Sekaki Variety

Noorzianna Abdul Manaf Yanty¹, Jalaldeen Mohammed Nazrim Marikkar²,
Bangun Prajanto Nusantara³, Kamariah Long⁴ and Hasanah Mohd Ghazali^{1*}

¹ Department of Food Science, Faculty of Food Science and Technology, Universiti Putra Malaysia, 43400 Serdang, Selangor DE, Malaysia.

² Department of Biochemistry, Faculty of Biotechnology and Biomolecular Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

³ Department of Food and Agricultural Product Technology, Faculty of Agricultural Technology, Gadjah Mada University, Yogyakarta 55281, Indonesia.

⁴ Malaysian Agricultural Research and Development Institute, P.O. Box 12301, 50774 Kuala Lumpur, Malaysia.

Abstract: A study was carried out to determine the physicochemical characteristics of the oil derived from papaya seeds of the Hong Kong/Sekaki variety. Proximate analysis showed that seeds of the Hong Kong/Sekaki variety contained considerable amount of oil (27.0%). The iodine value, saponification value, unsaponifiable matter and free fatty acid contents of freshly extracted papaya seed oil were 76.9 g I₂/100g oil, 193.5 mg KOH/g oil, 1.52% and 0.91%, respectively. The oil had a Lovibond color index of 15.2Y + 5.2B. Papaya seed oil contained ten detectable fatty acids, of which 78.33% were unsaturated. Oleic (73.5%) acid was the dominant fatty acids followed by palmitic acid (15.8%). Based on the high performance liquid chromatography (HPLC) analysis, seven species of triacylglycerols (TAGs) were detected. The predominant TAGs of papaya seed oil were OOO (40.4%), POO (29.1%) and SOO (9.9%) where O, P, and S denote oleic, palmitic and stearic acids, respectively. Thermal analysis by differential scanning calorimetry (DSC) showed that papaya seed oil had its major melting and crystallization transitions at 12.4°C and -48.2°C, respectively. Analysis of the sample by Z-nose (electronic nose) instrument showed that the sample had a high level of volatile compounds.

Key words: *Carica papaya* L., proximate analysis, fatty acids, triacylglycerols, melting and cooling points, volatile compounds

1 Introduction

Papaya (*Carica papaya* L.), belonging to the family Caricaceae, exists in almost all tropical and subtropical regions of the world¹⁻³. Being a tree-like herbaceous plant, papaya bears fruits throughout the year. Different forms, sizes color of the flesh of papaya are existed depending on the variety. The flesh of the papaya fruit may vary from yellow to orange or reddish. Each fruit may contain a large number of seeds which are usually attached in rows to the interior of the fruit.

The seeds of papaya are edible and found to have some spicy flavor which makes it a substitute for black pepper⁴⁻⁶. For instance, they are commercially used as an ingredient in Hawaii salad dressings⁷. The spicy-pungent flavor of the seeds is attributed to the presence of benzyl isothiocyanate^{8, 8-12}. The biologically active isothiocyanate has been found to act as cancer chemopreventive agents. Lohiya *et*

*al.*¹³ reported that the papaya seeds were used as a potential post-testicular anti-fertility drug. Papaya latex and seeds also have proven antihelminthic and anti-microbial activities¹⁴. For instance, it was found to be efficient in treating human intestinal parasites without side effects¹⁵.

There has been a considerable interest with regard to the oil potential of papaya seeds^{8, 16-18}. According to past studies, the oil content of papaya seed was found to be in a range of 13.9-30.7%^{8, 16-19}. Papaya seed oil is yellow (ranging from pale to dark yellow) in color and is almost odorless and flavorless²⁰; hence it can easily find new uses. Similarly, the residue left after the extraction of the seed oil is an industrially useful material. Aloba²¹ indicated that the defatted-seed flour of papaya may have some potential applications in food formulations since it was found to

*Correspondence to: Hasanah Mohd Ghazali, Department of Food Science, Faculty of Food Science and Technology
E-mail: hasanah@upm.edu.my

Accepted June 20, 2014 (received for review December 14, 2013)

Journal of Oleo Science ISSN 1345-8957 print / ISSN 1347-3352 online

http://www.jstage.jst.go.jp/browse/jos/ http://mc.manuscriptcentral.com/jjocs