

Mohamed Fawzy Ramadan *Editor*

Fruit Oils: Chemistry and Functionality

 Springer

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Preface

Over the last years, oils and fats production from fruits (fruit seeds, fruit pulp, fruit peel, and fruit pomace) has increased significantly to become one of the most important global sources of specialty oils/fats. New and superior nontraditional fruit varieties have been developed and released in main oil-bearing plants in several countries.

It is acknowledged that the contribution of fruit oils and fats to our health and well-being is recognized by their chemical composition. Fatty acid profile (i.e., the relative levels of saturated, monounsaturated, and polyunsaturated fatty acids) and a wide range of specific bioactive lipids (i.e., polar lipids, tocopherols, sterols, phenolics) have been shown to affect the biological functions of our bodies.

Upon invitation by the Springer Nature, this book was edited, which contains several chapters that describe different fruit oils and fats. With the aim at providing major reference work for those involved with the oils and fats industry as well as undergraduate and graduate students, this volume presents a comprehensive review of the results that have led to the advancements in fruit oils production, processing, functionality, and applications. As possible, the chapters followed a similar outline describing properties and processing of fruit oils and fats, with a focus on the extraction, chemical composition, quality of different fats and oils, and applications of fruit oils and fats in food and nonfood applications as well as nutraceutical products. I hope that the book will be a valuable source for people involved in oils and fats applications.

I sincerely thank all authors for their contributions and for their cooperation during the book preparation. The help and support given to me by the Springer Nature staff, especially *Daniel Falatko* and *Sofia Priya Dharshini*, was essential for the completion of my task and is appreciated.

Zagazig, Egypt

Mohamed Fawzy Ramadan

Fruit Oils: Chemistry and Functionality

Description

Fruit Oils: Chemistry and Functionality reported on the fruit oils and fats currently in use in food and nonfood applications, as well as those with significant commercial potential. Fruit oils and fats have an increasing number of applications in the food and pharmaceutical industry, due to the increase interest in “clean label” novel foods and the emerging markets in “free-from” and specialist foods.

Fruit Oils: Chemistry and Functionality covers several topics with a focus on lipid chemistry, technology, and functionality. The book covers specific topics including properties and processing of fruit oils and fats, extraction, quality of different fats and oils, and applications of fruit oils and fats in food and nonfood applications as well as nutraceutical products.

Fruit Oils: Chemistry and Functionality is a key text for functional food developers as well as research and development (R&D) managers working in all sectors using fats and oils. It is a useful reference work for companies reformulating their products or developing new products, as well as academics and students with a research interest in the area, such as lipid scientists, food scientists, and horticulturists.

Key Features

- * Broad coverage encompasses traditional and nontraditional fruit oils and fats.
- * Authored by international academics and industry experts.
- * Addresses growing application areas including functional foods, pharmaceuticals, nutraceuticals, and cosmetics.

Readership

- Academics and students with a research interest in the area (food chemists, lipid scientists, food scientists, horticulturists, and agronomists)
- Functional food developers and R & D managers working in all sectors using fats and oils

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Part III
Fats From Fruit Seeds and Pulp

Chapter 12

Rambutan (*Nephelium lappaceum*) Fats



Mohamed Elwathig Saeed Mirghani

Abstract Rambutan (*Nephelium lappaceum*) fruit is rich in carbohydrates, lipids, phosphorus, vitamin C, niacin, iron, calcium, copper, protein and fiber. Rambutan seed kernel fat (RSKF) can be a promising alternative edible fat that has the potential to be used in the food industry, especially to replace hydrogenated fat. The main fatty acids in RSKF are arachidic acid (38.3%) and oleic acid (37.1%). These two fatty acids covered 75.7% of the total fatty acids. RSKF exhibited several nutritional, biological and health promoting effects. This chapter reports on the chemical composition and health promoting impacts of RSKF.

Keywords Arachidic acid · Sapindaceae · Kernel fat · Hydrogenated fat

1 Introduction

1.1 The Origin of the Tree, Habitat, Production and Shape

Rambutan (*Nephelium lappaceum* L., family Sapindaceae), is indigenous to Southeast Asia, especially Indonesia, Malaysia, Thailand and Southern China as well. Nowadays it has been developed in the plantation for commercial agricultural production in many Asian countries including Thailand, Sri Lanka, Philippines, Brunei, Indonesia, Malaysia and Vietnam, in addition to Australia, Hawaii and Central America (Turner et al. 2011). Name “rambutan” originates from the Malayan word “rambut” which means “hair”, due to numerous hair-like spikes on the surface of the fruit. The rambutan tree is respected in landscaping since its evergreen, bushy and growing up to 20 m height. Leaves are compound of three to eight leaflets, which are elliptic, 7–20 cm long and 3–8 cm in width (Fig. 12.1). It has small, aromatic light green flowers,

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