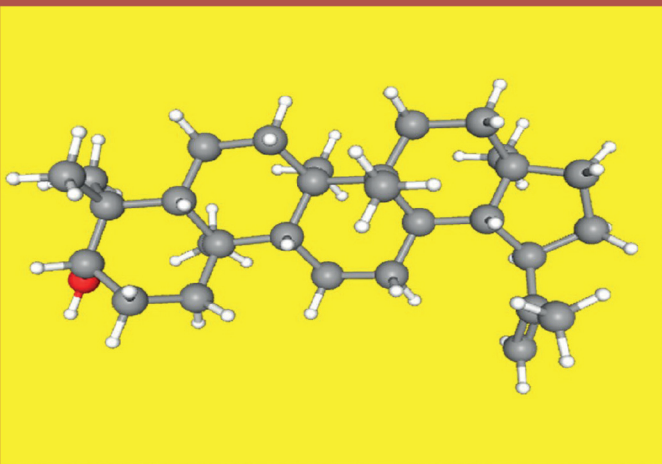


EDITED BY HIFZUR R SIDDIQUE

LUPEOL

THERAPEUTIC APPLICATIONS
IN HUMAN HEALTH AND DISEASE



Lupeol

Therapeutic Applications in Human Health and Disease

Edited by
Hifzur R Siddique



CRC Press

Taylor & Francis Group

Boca Raton London New York

CRC Press is an imprint of the
Taylor & Francis Group, an **informa** business

Designed cover image: Shutterstock

First edition published 2026

by CRC Press

2385 NW Executive Center Drive, Suite 320, Boca Raton FL 33431

and by CRC Press

4 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

CRC Press is an imprint of Taylor & Francis Group, LLC

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ISBN: 9781032986951 (hbk)

ISBN: 9781032986968 (pbk)

ISBN: 9781003600022 (ebk)

DOI: [10.1201/9781003600022](https://doi.org/10.1201/9781003600022)

Typeset in Times

by KnowledgeWorks Global Ltd.

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14 Roles of Lupeol-Rich Food on Gut Microbiota and Postbiotics in Human Diseases

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ABBREVIATIONS

SCFA	Short-chain fatty acids	IL-1β	Interleukin-1 beta
GBA	Gut-brain axis	TNF-α	Tumor necrosis factor – α
CRC	Colorectal cancer	MAPK	Mitogen-activated protein kinase
IBD	Inflammatory bowel disease	PPAR-γ	Peroxisome proliferator-activated receptor gamma
BDNF	Brain-derived neurotrophic factor	NF-κB	Nuclear factor-kappa B
IL-6	Interleukin-6		

14.1 INTRODUCTION

In recent decades, the complex interrelationships among nutrition, gut flora, and human health have been a crucial field of study. Dietary elements, especially bioactive chemicals derived from plants, have proven significant potential in altering the composition and function of gut microbiota, thereby affecting different physiological processes and disease outcomes (Fatma & Siddique, 2025). Natural triterpenoids, or phytosterols, are garnering increasing interest owing to their extensive range of biological functions. Triterpenes are a prevalent class of natural chemicals of significant practical importance, synthesized through the organization of squalene epoxide in a chair-chair-chair-boat configuration, followed by condensation (Liby et al., 2007; Siddique & Fatma, 2024).

Lupeol is prevalent in numerous fruits, vegetables, and medicinal plants, including mango, olive, strawberry, red grapes, cucumber, and medicinal herbs such as *Camellia sinensis* (green tea) and *Tamarindus indica* (tamarind) (Tsai et al., 2016). Global traditional medicine systems have employed lupeol-containing plants for ages to address a range of diseases, including inflammatory disorders and cancer. Contemporary scientific research has validated numerous traditional applications, demonstrating lupeol's anti-inflammatory, antioxidant, anticancer, cardioprotective, and antidiabetic attributes (Saleem, 2009; Sen et al., 2024; Parvez et al., 2025). Lupeol, abundant in plant-based foods, is a dietary