



Review

Exploring the astonishing beneficial effects of round gourd (*Praecitrullus fistulosus*) and plant lectins towards cancer: A comprehensive review

Ifrah Jabeen^a, Ammar B. Altemimi^{b,c}, Roshina Rabail^a, Sadia Kafeel^a, Arashi Shahid^a, Muhammad Inam-Ur-Raheem^{a,*}, Amin Mousavi Khaneghah^{d,e,**}, Rana Muhammad Aadil^{a,*}

^a National Institute of Food Science and Technology, University of Agriculture, Faisalabad 38000, Pakistan

^b Food Science Department, College of Agriculture, University of Basrah, Basrah 61004, Iraq

^c College of Medicine, University of Warith Al-Anbiyaa, Karbala 56001, Iraq

^d Faculty of Biotechnologies (BioTech), ITMO University 191002, 9 Lomonosova Street, Saint Petersburg, Russia

^e Halal Research Center of IRI, Iran Food and Drug Administration, Ministry of Health and Medical Education, Tehran, Iran

ARTICLE INFO

Keywords:

Round gourd

Praecitrullus fistulosus

Plant lectins

Cancer

Biomarkers

Bioactive components

ABSTRACT

Praecitrullus fistulosus, commonly known as round gourd or tinda, is a remarkable source of bioactive substances like polyphenols, antioxidants, carotene, magnesium, and vitamin C. It is considered one of the Cucurbitaceae family due to its medicinal features. Plant lectins are carbohydrate-binding proteins that can bind and identify the carbohydrate moieties upon cancerous cells demonstrated some anticancer potentials. Several plant lectins are helpful as cancer biomarkers because they can find cancer cells and contribute to cell death initiation via apoptosis and autophagy, suggesting the possible role of cancer-inhibiting pathways. Therefore, round gourd and lectins might be useful in the controlling of cancer. This study compiled the most recent scientific literature regarding the round gourd and numerous plant lectins, and the clinical trials of lectins exploring their effects on cancer were examined. Research according to the literature, round gourd, and lectins demonstrated pharmacological alterations not only in cancer but in many other disorders as well. Thus, clinical investigations proved the beneficial impacts of round gourd and lectins on cancer due to their antioxidants, anti-inflammatory, and anticarcinogenic properties. Further studies are required to fully comprehend the potential applications of these plant-derived compounds against cancer, as well as to identify the round gourd components and clarify their mode of action.

1. Introduction

“Cancer” refers to diseases in which the human body develops anomalous cells due to erratic mutations. These cells multiply uncontrollably and circulate all over the organs throughout generation. Overall, cancer becomes the main reason for death after heart illnesses. One in six people worldwide dies from cancer, which is the second most prevalent cause of fatality [1,2]. According to the American Cancer Society, there will be 1,958,310 new cancer cases and 609,820 cancer-associated mortalities; notably, 1670 deaths each day are estimated to occur in the United States within 2023. In males, lung, prostate, or colorectal cancers, while in females, lung, breast, or colorectal cancers contribute to many mortalities [3,4].

Globally, the prevalence and mortality from cancer is increasing quickly; behind is the population’s aging and expansion as well as changes in the occurrence and dispersion of the leading risk factors for cancer, various of which are correlated to socioeconomic development. In 2020, it is expected that 58.3 % of cancer deaths and half of all cases for both sexes will occur in Asia, which is linked to 59.5 % of the world’s population [5,6]. Any organ in the body can generate cancerous cells, but the lungs, colon, rectum, breasts, brain, liver, skin, stomach, and prostate are the most commonly affected organs [2]. Lung cancer, specifically small-cell lung cancer, constitutes one of the most dangerous malignant tumors [7–9], with a projected 1.69 million deaths every year globally [10,11]. Abnormal metabolism, modified nuclear morphology, discontinuous cell cycles, recurring mutations, immune system rigidity,

* Corresponding authors.

** Corresponding author at: Faculty of Biotechnologies (BioTech), ITMO University 191002, 9 Lomonosova Street, Saint Petersburg, Russia.

E-mail addresses: raheemuaf@uaf.edu.pk (M. Inam-Ur-Raheem), mousavi.amin@gmail.com, mousavi@itmo.ru (A. Mousavi Khaneghah), mohammad.aadil@uaf.edu.pk (R.M. Aadil).

<https://doi.org/10.1016/j.ijbiomac.2024.132629>

Received 22 March 2024; Received in revised form 20 May 2024; Accepted 22 May 2024

Available online 28 May 2024

0141-8130/© 2024 Elsevier B.V. All rights reserved, including those for text and data mining, AI training, and similar technologies.