

Chapter 8

Millet in Cancer Therapy: An Emerging Wonder Grain in Cancer Therapeutics

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ABSTRACT

Millet, an ancient whole grain, has a variety of health benefits. Its minerals support bone health. Incorporating millet into a healthy diet can improve overall health and provide a flexible and nutritious grain alternative. Despite its role in providing essential nutrients to the body, millet also has anticancer properties which make it an essential grain for the treatment of different types of cancer. Antioxidants of millets such as flavonoids and phenolic compounds, may help prevent oxidative stress and cellular damage, both of which have been associated with cancer formation. Its high fiber content promotes healthy digestion and intestinal regularity, potentially lowering the risk of colorectal cancer. Certain millet varieties also include lignans, which may alter hormone metabolism, potentially lowering the incidence of hormone-related malignancies such as breast cancer. This chapter will explain the role of different natural compounds and phytochemicals from varieties of millet in the treatment of these two main cancers

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1. INTRODUCTION

Millet belongs to the Poaceae family and encompasses grains from various forage grasses. Due to their grain texture, these grains are categorized as “coarse cereals” similar to sorghum, which makes them less convenient to process and prepare than rice and wheat (Subba Rao et al. 2002; Hassan and Zahra Mohammed 2021). The distinctive qualities of millet make it desirable for both agricultural production and human consumption. In terms of agricultural output, it is ranked as the sixth-largest cereal crop in the world. The crop is more advantageous than most major cereals in several ways, making it especially desirable in regions with difficult agricultural conditions. The resistance of millet to pests and pathogens is one of its important characteristics. Because of this resilience, farmers have a less harmful choice that requires less frequent use of pesticides. Additionally, millet has a shorter growing season than other grains, which enables farmers to cultivate it more effectively and harvest it earlier. Moreover, millet produces well even in dry conditions, which is crucial in areas where a lack of water is a regular problem (Belton et al. 2002; Ajiboye et al. 2017; Devi et al. 2014; Michaelraj et al. 2013). Due to these positive traits, developing nations have expressed a strong interest in using millet as a food source, while some wealthy nations are looking into its potential for the production of bioethanol and biofilms (Li, Jingjun, et al. 2008). Millets can be used as a food source to give human populations nutritional and economic security, particularly in dryland areas of rural India (Pradhan et al. 2010). Millet is a crucial component of the staple diet in many African and Asian nations, especially for the less affluent sections of the population (Chandrasekara et al. 2011). In these regions, millet is frequently used to make traditional dishes and drinks, including bread, porridge, and snack items, whether they are fermented or not (Chandrasekara et al. 2012; Blandino et al. 2003). Millet has different varieties such as proso millet (*Penicum miliaceum*), little millet (*Panicum sumatrense*), kodo millet (*Paspalum setaceum*), pearl millet (*Pennisetum glaucum*), foxtail millet (*Setaria italic*), finger millet (*Eleusine coracana*), sorghum (*Sorghum bicolor*), oats (*Avena sativa*), barnyard millet (*Echinochloa utilis*), proso millet (*Penicum miliaceum*), barley (*Hordeum vulgare*) (Bouis and Howarth E 2000; Kaur et al. 2014). Statistical analysis conducted by the Agricultural and processed food products export development authority (APEDA) found that India is the world’s greatest producer of millet with pearl millet being the leading type in India among all the varieties that account for 40.51% of the total production of millet in the whole world in 2020 (<https://apeda.gov.in/milletportal/Production.html>).

In the coming decades, it is anticipated that climate change will significantly reduce the world’s production of wheat, rice, and maize, by anywhere between 13% and 20%, according to a recent study by the Consultative Group for International

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