EXPLORING THE EFFICACY OF TRADITIONAL MEDICINES IN CANCER CARE: BRIDGING ANCIENT WISDOM WITH MODERN SCIENCE

Gowhar Rashid[1], Deena Elsori[2], Wael Hafez[3], Rana A Youness[4], Saliha Rizvi[5], Sonia Tamanna[6], Azimova Bahtigul[7]
[1]Amity University, Gurgaon, India
[2]Rabdan Academy, United Arab Emirates
[3]The National Research Centre, Cairo, Egypt.
[4]German University in Cairo, Egypt
[5]Era University, Lucknow, India
[6]University of Dhaka, Bangladesh
[7]Tashkent Pharmaceutical Institute, Uzebekistan
Corresponding email: gowhar9@gmail.com
https://doi.org/10.5281/zenodo.10682779

Abstract. Cancer stands as the leading cause of morbidity and mortality worldwide(1,2). To date, multiple interventions such as chemotherapy, surgical resection, radiotherapy, and targeted therapy are employed; however, the lack of therapeutic options for metastatic cancer, resistance to drug therapy, and the lack of targeted therapy are some of the major challenges(3). While extensive cancer management research is ongoing, the associated adverse effects and financial burdens underscore the urgent need for a more effective, side effect-free, easily accessible, and cost-efficient intervention in cancer treatment. Given the safe nature of traditional medicines, numerous studies have been investigated on many traditional drugs for their anti-cancer potential and found to be very effective. The vast reservoir of medicinal plants houses natural compounds, often termed 'chemical goldmines,' seamlessly embraced by the mammalian system. Most of these compounds cannot be synthesized in laboratories, hence, illustrates the importance of nature in today's scenario. These active constituents are exceptionally reliable sources for the development of novel and effective anti-cancer drugs with improved efficiency and decreased adverse reactions. They possess complementary and overlapping mechanisms that slow down the carcinogenic process by scavenging free radicals, inhibiting metabolic enzymes and transporters, PI3K/AKT oncogenic signaling, Ras/Raf/MEK/ERK/MAPK pathways, suppressing survival and proliferation of malignant cells, as well as diminishing invasiveness and angiogenesis of tumors. Traditional remedies such as Cuscuta reflexa, Zingiber officinalis, Curcuma longa, and Withania somnifera exhibit potent anti-cancer effects. Cuscuta reflexa Roxb. demonstrates remarkable anti-tumor activity against Ehrlich Ascites carcinoma cells by inhibiting NF-κB binding, downregulating TNF-α and COX-2, and inducing apoptosis in hepatocellular cells. Zingiber officinale Roscoe's bioactive component, 6-Shogaol, significantly inhibits NCI-H1650 lung cancer cell growth by targeting Akt1 and Akt2 and suppressing Akt signaling. These findings underscore the potential of medicinal plants as anti-cancer agents, warranting further exploration for effective malignancy management.

Keywords: Cancer, Medicinal Plants, Traditional Medicine, Anti-cancer Agents.

Relevance of the Topic: Cancer remains a significant global health challenge, necessitating the exploration of alternative treatment options to improve efficacy and reduce adverse effects.

Purpose of the Study: This study aims to highlight the potential of medicinal plants as effective anti-cancer agents, addressing the limitations of current cancer treatments.

Research Methods: Literature review and analysis of studies investigating the anti-cancer properties of medicinal plants.

Main Results and Conclusions: Medicinal plants contain natural compounds with diverse mechanisms of action that exhibit potent anti-cancer effects. Further research and exploration of these compounds are warranted for the development of novel and effective cancer treatments.

References:

1. Lowy DR, Collins FS. Aiming High--Changing the Trajectory for Cancer. N Engl J Med 2016;374:1901-4. 10.1056/NEJMp1600894.
2. Sung H, Ferlay J, Siegel RL, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2021; 71: 209–249.
3. Bayat Mokhtari R, Homayouni TS, Baluch N, et al. Combination therapy in combating cancer. Oncotarget 2017; 8: 38022–38043