

Chapter 15

Conservation Strategies of Anticancer Plants

S. Kanimozhi

Bharath Institute of Higher Education and Research, India

M. Kanthimathi

St. Mariam College of Pharmacy, India

S. Nagarani

Chaoyang University of Technology, Taiwan

ABSTRACT

Cancer is still one of the most serious global health crises, affecting millions of people each year. Many plants have bioactive compounds that may be able to fight cancer, making them valuable sources for developing new drugs and complementary therapies. A variety of anticancer plants contain phytochemical components that have been associated to anticancer activities. Many plant species have compounds with anti-cancer properties, making them crucial sources for the development of cancer therapies. The natural habitats of these anticancer plants have been destroyed due to their extensive use in anticancer treatment, so these plants are in danger of going extinct. The habitat loss brought on by environmental have led to the endangered status of many anticancer plants globally. The destruction of their ecosystems and the unsustainable exploitation of these anticancer plants pose a significant risk. This chapter provides a complete conservation strategy for plants that are anti-cancer to ensure their continued use as medicines.

1. INTRODUCTION

The global issue of cancer has led to advancements in both curative and preventive therapies. Unregulated cell proliferation and the emergence of malignant tumours is its defining features. One of the leading causes of death and illness worldwide, cancer is predicted to affect 21 million people by 2030. Cases of the disease are predicted to rise steadily (Siegel et al., 2016; Pallavi and Shraya, 2022). Because of the

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high death rate linked to cancer, researchers are looking at other forms of treatment. Chemotherapy and radiation therapy are two common traditional cancer treatments that frequently have serious adverse effects. However, the well-documented unfavourable effects of these approaches have prompted researchers to explore for novel therapeutic drugs. Because of this, researchers are now looking for possible anticancer chemicals in natural sources, especially plants.

Several investigations have been carried out to assess the potential anticancer effects of natural chemicals obtained from plants. Because they contain a multitude of secondary metabolites, plants and their derivative by-products have traditionally been the main source of medicinal medicines. Plant secondary metabolites, including polyphenols, flavonoids, and brassino steroids, have demonstrated a range of anticancer properties, including antioxidant activity, apoptosis induction, reduction of cancer cell growth, target selectivity, and cytotoxicity against cancer cells. Compounds with potential anticancer properties have been found in a variety of plant families, including vinca alkaloids, taxanes, derivatives of camptothecin, colchicine, ellipticine, berberine, combretastatins, flavanoids, gingerol, lycopene, cyanidin glycosides, ursolic acid, paclitaxel, etc. (Iqbal et al., 2017 and Sakna et al., 2022).

These investigations have been done on live things (in vivo) as well as in lab settings (in vitro). Sulforaphane and other phenolic compounds are among the potential molecules that have surfaced during the pre-clinical stages. These substances have demonstrated the ability to cause apoptosis, or programmed cell death, and to suppress the proliferation of cancer cells (Prakash and Upadhyay, 2021). In conclusion, it is expected that these compounds will play a major role in future cancer therapeutics, even if additional study is needed to generate safer and more effective phytochemical medications. Promising paths for the progress of cancer treatment include the investigation of natural sources and the creation of creative solutions to problems.

2. LOSS OF BIODIVERSITY OF ANTICANCER PLANTS

Today's most potent cancer chemotherapeutics come from natural sources, as medications derived from wild plants are used to treat cancer. The National Cancer Institute states that throughout the past 25 years, at least 70% of newly approved medications in the US have been sourced from natural sources (Steenhuysen, 2007 and Pundalik et al., 2022). Every year, at least 30,000 lives are saved in the US by plant-derived anti-cancer medications like taxol, which was initially extracted from the Pacific yew (Daily, 1997). 11% of the world's important medications, according to the WHO, come from flowering plants. Currently, scientists are debating whether the loss of biodiversity poses a greater risk to humankind than climate change. Experts from all around the world claim that excessive utilization of wild anticancer plants is causing declines in biodiversity and may eventually reduce the availability of natural medicines. Before we realize it, we are eradicating the entire species and making them as extinct. The main factors contributing to the loss of biodiversity of these wild anti-cancer plants are human activities such as pollution, overuse of wild resources, invasive species introduction, altered land use and degradation from agriculture and urbanization.

India has over 130,000 scientifically documented plant and animal species, making it a country with remarkable biodiversity (Oseni et al., 2021; Solomon et al., 2020). However, this biodiversity is threatened by habitat destruction, overexploitation, pollution, and the introduction of non-native species. Natural disasters such as diseases, fires, cyclones, droughts, and floods also contribute to the loss of biodiversity. Conserving biodiversity is crucial as it provides numerous benefits, including material

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