Herbal Medicines as Cancer Treatment

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ABSTRACT
Cancer is a disease caused by abnormal growth of cells in body tissues that turn into cancer cells. Today, treatment for cancer can be done with chemotherapy, radiotherapy, and surgery. Some of the most commonly used chemotherapy drugs are antimetabolites, DNA interactive compounds, antitubulin compounds, hormones, and molecular targeting compounds. Currently, many herbal plants are trusted by the public as anticancer drugs, as shown by several studies and the availability of herbal plants is relatively easier to find by the public. In addition, medicine from plants Herbs can also be used for the prevention and treatment of cancer. This review will discuss about herbal plants that can be used as anticancer. The results of the review show that the use of herbal plants or natural ingredients in cancer therapy has an effect by various mechanisms such as suppressing cell proliferation, induction of apoptosis, slowing metastasis, without reducing the quality of life of cancer patients.

Introduction
Cancer is a disease caused by abnormal and uncontrolled cell growth and has the potential to damage or metastasize to other parts of the body. Until now, cancer is still a world health problem whose number is estimated to continue to increase. In 2012, about 8.2 million cases of death were caused by cancer. From the results of Basic Health Research (Riskesdas) data in 2013, it is known that the prevalence of cancer in Indonesia is 1.4% or around 347,792 people.1,2

In its development, cancer therapy is carried out with chemotherapy, radiotherapy, and surgery. Some of the most commonly used chemotherapy drugs are antimetabolites, DNA interactive compounds, antitubulin compounds, hormones and molecular targeting compounds. However, the use of these chemotherapy drugs can cause side effects such as hair loss, bone marrow suppression, drug resistance, gastrointestinal lesions, neurological dysfunction, and cardiac toxicity.3-5

The active compounds of herbal plants are one of the alternatives in the search for new anticancer because it is believed to have minimal side effects. Anticancer from herbal plants can be in the form of plant extracts or single active compounds obtained from plants. This review will discuss several herbal plants that have been studied to have anticancer activity.

Discussion
With its development, a lot of research has been done for the discovery of new cancer drugs. Currently, several herbal plants and single active compounds isolated from herbal plants have been
found that can be used as anticancer drugs. From the results of the literature search, it was found that herbal plants and compounds that have anticancer activity.

**Garlic**

*Allium sativum* or garlic is known to have anticancer effects. Epidemiological studies explain that the consumption of garlic can provide a protective effect on gastrointestinal cancer. In another study, consumption of garlic suppressed the progression of colorectal adenomas and increased the activity and number of Natural Killer cells by its active compound, S-allylcysteine. Because of this, garlic can prevent a decrease in the quality of life due to cancer. Another compound contained in garlic is organosulfur which can prevent cancer, including colon cancer. The study was conducted by comparing S-allylcysteine and S-allylmercaptocysteine contained in garlic on HT-29 and SW-480 colon cancer cells. The results showed that SAMC can inhibit growth and inactivate cells in the G-2-M phase and induce apoptosis. There are several side effects caused by excessive consumption such as itching, eczema in the upper extremities, epigastric pain, and glossitis.

**Ginseng**

Based on the results of clinical trials, *P. ginseng* contains 9,10-dimethyl-1,2-benzanthracene, urethane, aflatoxin B1, and N-2-fluorenylacacetamide which can reduce the incidence of cancer and improve the effect on cancer patients. Studies show that fresh ginseng, juice, and tea can reduce the risk of pharyngeal, laryngeal, esophageal, stomach, colorectal, pancreatic, liver, lung, and ovarian cancers. However, there are side effects when consumed in excess, such as sleep disturbances, increased blood pressure, headaches and diarrhea.

**Turmeric**

Turmeric contains the active compound curcumin. Oral curcumin is well tolerated, although absorption is limited to nanogram levels, but has biologic activity in some patients with pancreatic cancer. Preclinical data suggest that curcumin has potent activity against pancreatic cancer, but higher levels of exposure need to be achieved. Curcumin is hydrophobic, therefore it cannot be given intravenously. However, lipophilic encapsulated in liposomes can be administered by the intravenous route. Systemically administered liposomal curcumin has antitumor activity in vitro and in vivo, and has no toxicity in animal studies. Turmeric can cause side effects in the form of rashes, inhibiting the absorption of iron in the body, and stomach problems when consumed in excess.

**Green tea**

Recent studies have shown that cathecin, a polyphenolic compound found in green tea, is an active constituent that provides anticancer effects. Green tea contains epigallocatechin-3-gallate (EGCG) which is the most abundant type of catechin and accounts for about 50-75% of the total catechin content. EGCG is also the most effective antioxidant in terms of its health benefits. In laboratory tests, EGCG has toxic properties for cancer cells. EGCG can also prevent the action of growth factors needed to form and grow new blood vessels, thereby preventing cancer cells from growing and spreading quickly from one location to another. Excessive consumption of green tea can cause side effects in the form of excess caffeine, impaired absorption of iron, and excess calories.

**Resveratrol**

Resveratrol (trans-3, 4’, 5-trihydroxystilbene) is a phytoalexin found in the skins of grapes, nuts, and other fruits. Known for its antioxidant and anti-inflammatory effects as well as inhibiting the proliferation of cancer cells. The antiproliferative effect of resveratrol is mediated through inhibition of transcription factors. Increased Bax/Bcl-2 ratio and upregulation of caspase triggers apoptosis. Resveratrol also has the effect of inhibiting the
initiation and metastasis of colon cancer because it acts as an effector of Wnt signaling and regulates processes related to tumor initiation, tumor growth, cell death, and metastasis. These results indicate that the consumption of resveratrol can induce an anticarcinogenic effect in the gastrointestinal tract. However, excessive use can cause side effects such as anemia and joint pain.19

Conclusion

With the rapid development of research on new drugs, herbal plants can be used as an option in cancer treatment. Several studies in this field have proven that herbal plants have various specific mechanisms as anticancer. Some herbal plants that can be used as anticancer are garlic (Allium sativum L.), Ginseng (Panax ginseng), Turmeric (Curcuma longa L), Green Tea (Camellia sinensis L), and compounds from plants such as Resveratrol.

References