

CHAPTER I

INTRODUCTION

1. Background and Rationale

Cancer is still a serious clinical problem and has a significant social and economic impact on the human health care system. It is a major cause of morbidity and mortality which affects over ten millions people worldwide. More than 60 % of cancer deaths and approximately half of new cases occurred in developing countries (1). The statistics from Thailand Bureau of Health Policy and Strategy, Ministry of Public Health, demonstrated that the incidence of cancer in 1998 to 2002 was increased from 48.7 % to 73.3 % (2). Despite there are many therapeutic advances in the understanding of the processes of cellular and molecular carcinogenesis, the therapeutic problems still remain (1). The development of new anticancer agents was needed to solve the resistant and unwanted effect problems of current chemotherapeutic agents used in clinic.

Not only new synthetic compounds but also new biologically active products are major sources for the discovery of new anticancer drugs. Natural products including plants, microorganisms and marines provide rich resources for anticancer drug discovery (3). They have shown chemopreventive and chemotherapeutic potential in a variety of bioassay systems and animals models. Some of them and their semisynthetic analogs have dramatically improved the effectiveness of chemotherapy against some of the deadliest cancers. These are vinca alkaloids (vincristine, vinblastine) isolated from the periwinkle plant *Catharanthus roseus* ; podophyllotoxins derived from the mayapple root *Podophyllum peltatum* (etoposide, teniposide) ; taxanes, originally isolated from the bark of the yew tree *Taxus brevifolia* (paclitaxel, docetaxel) ; and camptothecins derived from the bark of *Camptothecia acuminate* (topotecan , irinotecan) (4).

In Thailand, natural products are still used as traditional medicine or alternative for cancer treatment. Many herbal plants are employed in traditional remedy for cancer, including *Murdannia loriformis* (Hassk.) (6), *Brucea javanica* Linn. Mer (7), *Rhinacanthus nasutus* Linn. Kurz (8) and *Stephania venosa* (9-11).

Stephania venosa (BL.) Spreng is classified in the family Menispermaceae. Its parts have been used for treatment of various kinds of diseases. Its leaves are used for curing wound. The flowers are used for leprosy treatment. The roots are used for improving nerve and asthma therapy (8, 11). The tuber has been used in the remedy of various diseases including cancer. It is commonly used by boiling in water and soaking in alcohol. The tuber contains many isoquinolone alkaloids (12-14). Some of these alkaloids from *S.venosa* were demonstrated the cytotoxic effect (14). The water extract of the tuber had cytotoxic, antiproliferative and apoptotic induction activities on PBMCs of both normal subjects and patients with cervical cancer (15). The ethanol extract had cytotoxic effect against human cancer cell line MCF-7 (16). However, there was a few studies that compared the effects of the water and the ethanol extract of *S.venosa*. So this study aimed to compare antitumor activities including cytotoxic, antiproliferative and apoptotic effects between the water and the ethanol extracts of *S.venosa* tuber.

2. Objective

1. To examined cytotoxic, antiproliferative and apoptotic effects of the water and the ethanol extracts of *S. venosa* tuber on PBMCs and Jurkat cells
2. To compared cytotoxic, antiproliferative and apoptotic effects of both extracts on PBMCs and Jurkat cells.

3. Keywords:

Stephania venosa (Bl.) Spreng

Cytotoxic

Antiproliferative

Apoptosis

Peripheral blood mononuclear cells