CHAPTER I

INTRODUCTION

Nowadays cancer is the second leading cause of death in Thailand (Department of provincial administration, Ministry of Thailand, 2003). It is due to many factors, one of which is the tendency towards taking more red meat than the past, resulting in an increase in cancer incidence (WCRF/AICR, 1997). Cancer treatments consume both time and expense. Therefore, many researches are aimed at finding anticancer substances which can help to reduce the probability of cancer incidence. It is well known that vegetables contain several classes of phytochemicals that have antioxidative, antimutagenic and anticarcinogenic effects, making them useful for protecting atherosclerosis, cancer and other diseases in human. Some investigators reported that some types of Thai herbs, found in almost all dishes in Thai cuisine, exhibited inhibitory effects on mutagenesis induced by many chemical substances. The methanol extracts of Thai bitter gourd fruits, sesbania leaves and flowers, cassia leaves and flowers, ivy gourd and sweet basil showed antimutagenic activity towards *Salmonella typhimurium*, mainly against indirect mutagens such as aflatoxin B1 and benzo[a] pyrene (Kusamran *et al.*, 1998). Moreover, Murakami *et al* (1995) found that vegetables which had strong smell such as Pak Ka Yang, Pak Chee Lao, and Krachai presented antimutagenic property. Edenharder *et al.* (1995) found antimutagenic effects of extracts from fruit and vegetable on mutagenicity induced by heterocyclic amine, namely 2-amino-3-methylimidazo[4,5-*f*']quinoline(IQ) in *Salmonella typhimurium* TA98.

Meat extracts (Hargraves and Pariza, 1983; Taylor, Fultz and Knize, 1985; Gross, 1990) and cooked meat (Felton *et al.*, 1981; Sugimura and Sato, 1983; Knize *et al.*, 1985; 1988) contained potent mutagenic heterocyclic aromatic amines (HAAs). Several compounds were shown to be carcinogenic in long-term animal studies (Adamson *et al.*, 1990; Ohgaki *et al.*, 1991, Wakabayashi, 1992; Munro, 1993). Many

studies showed that beef extract treated with nitrite under gastric like condition acted as a potent mutagen *in vitro* and *in vivo* (Munzner, 1986; Yano *et al.*, 1988).

Therefore, it was of interest to investigate the antimutagenicity of some vegetables often consumed by Thai people, especially in the north-eastern area, namely Pak Gud (*Diplazium esculentum* SW), Pak Ka Yang (*Limnophila aromatica* Merr.), Pak Chee Lao (*Anethum graveolens* L.), Pak Krad Hua Wan (*Sphilanthus acmella* L.), and Pak Pai (*Polygonum odoratum* Lour.). The information obtained from this research can be used to justify the kinds of vegetable that will be beneficial to consumer's health.