

CHAPTER I

INTRODUCTION

Rationale of the study

Erectile dysfunction (ED) has been defined as the inability to achieve or maintain an erection sufficiently for satisfying sexual intercourse. ED can cause a profound negative impact on the quality of the patient life, resulting in loss of self confidence and depression. The disorder is a common problem affecting the well-being of men. It has been estimated that 18 million men age between 40-70 years in the United States and 9 million men in Brazil are affected by some degree of ED [1]. In Thailand, ED prevalence in men age between 40-70 years is 37.5% [2]. Similar ED rates are also found in France, where 31.6% of men aged 40 years and over are reported with ED [3]. The disorder is a common problem and the prevalence increases with age [4]. Approximately 49% of 40 years old men and 67% of 70 years old men suffer from ED. The causes of the disorder are organic, psychological, psychiatric, interpersonal, and pharmacological factors. ED is not life-threatening, however, it should not be regarded as a benign disorder as it can have a strong negative effect on interpersonal relationships, well-being and quality of life. The treatments of ED include vacuum-constriction devices, intracavernosal injections of vasoactive agents and venous or arterial surgery as well as oral medication. Sildenafil (Viagra[®]) is the first oral drug approved by the US-FDA to treat ED in 1997 and has become one of the most popular prescription drugs [5]. Sildenafil is a potent competitive inhibitor of type 5 cGMP-specific phosphodiesterase enzyme, the predominant isozyme in the human corpus cavernosum, and therefore, enhances cGMP activity and thereby nitric oxide function in smooth muscle relaxation causing penile erection [6, 7]. In a recent report, US-FDA has warned about the deaths due to sildenafil and mentioned the possibility of dangerous drug interaction with other drugs as older patients may be taking drugs for treatment of other ailments as well [5].

Butea superba Roxb., known as "Kwaao Khrua Daeng" in Thai, is a plant in the *Papilionaceae* family [8,9]. It is mostly found in the northern region of Thailand. *B. superba* has been used as a natural product for physical and mental strength and for prevention of age-related health problems. In Thai traditional medicine, *B. superba* is a rejuvenating herb for men [10]. Compounds extracted from *B. superba* are effective in inhibiting cAMP phosphodiesterase *in vitro*, the mechanism of which has been shown to play an important role in penile erection [11]. Current commercial products contain higher amount of *B. superba* than the recommended one. Despite the fact that more people frequently consume the products, therapeutic doses and toxicity study have not been reported. Therefore, this study aimed to investigate effects of *B. superba* in an established *in vivo* model, in which erection was induced in rats by stimulating the cavernous nerve. In addition, acute and chronic toxicity studies of the most active part of the alcoholic extracts from *B. superba* were also performed.

Purposes of the study

1. To screen for the most active part of *B. superba* alcoholic extracts of collected from Phrae and Phayao, Thailand.
2. To study the effects of the *B. superba* alcoholic extracts on intracavernous pressure (ICP).
3. To examine the effects of *B. superba* extracts on cGMP and/or cAMP-mediated relaxation of cavernous muscle in *in vitro*.
4. To investigate the effects of *B. superba* extracts on the reproductive system using models of sperm quantity and motility test.
5. To study acute and chronic toxic effects of *B. superba* alcoholic extracts.