



CHAPTER I

INTRODUCTION

Croton sublyratus Kurz or Plau-noi (Thai-name) is the plant belonging to the family of Euphorbiaceae. It is a deciduous shrub or tree with 2-3.5 m in height (ลีนา ผู้พัฒนาพงศ์ และธวัชชัย วงศ์ประเสริฐ, 2530; ลัดดาวัลย์ บุญรัตน์กรกิจ, 2535; Ponglux *et al.*, 1987). It grows extensively in tropical areas, especially those near by the Andaman sea such as Indonesia, Malaysia, Thailand, Burma and the south of China (ณรงค์ เฟื่องปรีชา, 2530). In Thailand, *C. sublyratus* is found to be native to the Thai provinces of Prachin Buri, Prachuap Khiri Khan and the border near Burma of Kanchanaburi (สำนักงานคณะกรรมการวิจัยแห่งชาติ, 2533; ณรงค์ เฟื่องปรีชา, 2530; ลีนา ผู้พัฒนาพงศ์ และธวัชชัย วงศ์ประเสริฐ, 2530; ลัดดาวัลย์ บุญรัตน์กรกิจ, 2535; วิณา วิรัชฉริยากุล และคณะ, 2533). The propagation of *C. sublyratus* includes budding (to form plantlet from root), seedling and cutting (สำนักงานคณะกรรมการวิจัยแห่งชาติ, 2533; เปรมจิต นาคประสิทธิ์, บรรณาธิการ, 2528).

C. sublyratus as a medicinal plant has been of interest. Its leaves have been used as raw material for manufacturing an antipeptic ulcer drug (นันทวัน บุญยะประภัศร, 2532). In the past, the plant was used as a Thai folk medicine for anthelmintic and dermatologic agent for skin disease (ภาควิชา เกษัชพฤษศาสตร์ คณะเภสัชศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย, 2530; ลัดดาวัลย์ บุญรัตน์กรกิจ, 2535; Ponglux *et al.*, 1987). For its chemical constituents, *C. sublyratus* has been reported to contain many groups of compounds, such as diterpene lactones (Kitazawa *et al.*, 1979; Kitazawa *et al.*, 1980), furanoid diterpenes

(Takahashi *et al.*, 1980), diterpene alcohols (Kitazawa and Ogiso, 1981), esters (Kitazawa *et al.*, 1982) and plaunotol, the active antipeptic ulcer substance (Ogiso *et al.*, 1978).

Plaunotol is an acyclic diterpene alcohol which has already been registered with the World Health Organization (WHO) under the code CS-684 (ณรงค์ เพ็ญประสิทธิ์, 2530; นันทวัน มุณเฑาะระประภัศร, 2532; Sununta Cajesanun, 1991). The drug containing plaunotol which is known as "Kelnac" has been manufactured by a Japanese pharmaceutical firm, Sankyo Co., Ltd. The drug is used for antipeptic ulcerative with broad spectrum inhibition against the gastric ulcer (ณรงค์ เพ็ญประสิทธิ์, 2530; วิณา วิรัชฉริยากุล และคณะ, 2533; Department of Medical Information, Sankyo Co., Ltd., 1993; Ogiso *et al.*, 1985). Since attempts to synthesize plaunotol chemically at a price competitive with the natural product have not so far been successful, the company has cultivated *C. sublyratus* in Thailand at Prachuap Khiri Khan with the area more than 7000 rai. The plantation site has more than a million plants for supplying leaves for plaunotol extraction (ณรงค์ เพ็ญประสิทธิ์, 2530; นันทวัน มุณเฑาะระประภัศร, 2532). In Chulalongkorn University, an effective large-scale process of extraction and purification of plaunotol from *C. sublyratus* leaves has been investigated and developed by the Institute Biotechnology and Genetic Engineering (Nilubol, 1992; Sununta Cajesanun, 1991). The developed process has been patented in Thailand, Britain and the United States.

In order to improve not only the possibilities of searching for genetically stable, high-yielding plants of *C. sublyratus* but also to obtain a closer insight into the potential of plaunotol production in the genus *Croton*, a TLC-densitometric method was developed which allows rapid and precise

measurement of plaunotol. Up to now only laborious and time consuming GC methods have been available for the quantitation of plaunotol (Ogiso *et al.*, 1981 ; Sununta Cajesanun, 1991). The TLC–densitometric method, in principle, allows the determination of plaunotol even in unpurified plant extracts and also allows a large number of samples to be analyzed per person per day. These make the TLC–densitometry an efficient analytical method for a screening program for high plaunotol–yielding plants.

In addition, this study also aims to investigate the propagation of *C. sublyratus* through plant tissue culture technique. It is expected that the information obtained from this study will lead to an opportunity to propagate this plant which has been selected through our effective screening program.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย