



**DEVELOPMENT OF ENZYME-LINKED IMMUNOSORBENT ASSAYS FOR
DETERMINATION OF MULBERROSIDE A AND EFFECTS OF
ELICITORS ON THE PRODUCTION OF MULBERROSIDE A
IN ROOT AND CELL SUSPENSION CULTURES OF
*MORUS ALBA L.***

MR. JUKRAPUN KOMAIKUL

**A THESIS FOR THE DEGREE OF MASTER OF PHARMACY
KHON KAEN UNIVERSITY**

2013

**DEVELOPMENT OF ENZYME-LINKED IMMUNOSORBENT ASSAYS
FOR DETERMINATION OF MULBERROSIDE A AND EFFECTS OF
ELICITORS ON THE PRODUCTION OF MULBERROSIDE A
IN ROOT AND CELL SUSPENSION CULTURES OF
*MORUS ALBA L.***

MR. JUKRAPUN KOMAIKUL

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER
OF PHARMACY IN PHARMACEUTICALS
GRADUATE SCHOOL KHON KAEN UNIVERSITY**

2013



THESIS APPROVAL
KHON KAEN UNIVERSITY
FOR
MASTER OF PHARMACY
IN PHARMACEUTICALS

Thesis Title: Development of enzyme-linked immunosorbent assays for determination of mulberroside A and effects of elicitors on the production of mulberroside A in root and cell suspension cultures of *Morus alba* L.

Author: Mr. Jukrapun Komaikul

Thesis Examination Committee:

Assist. Prof. Dr. Natsajee Nualkeaw	Chairperson
Assoc. Prof. Dr. Waraporn Putalun	Member
Dr. Supaart Sirikantaramas	Member

Thesis Advisor:

..... Advisor
(Assoc. Prof. Dr. Waraporn Putalun)

.....
(Assoc. Prof. Dr. Lampang Manmart) (Assoc. Prof. Dr. Wongwiwat Tassaneeyakul)
Dean, Graduate School Dean, Faculty of Pharmaceutical Sciences