

"Development of extraction methods and biological activity studies of *Amomum krervanh* Pierre ex Gagnep. for development as an anti-inflammatory product to promote the utilization of *Amomum krervanh* Pierre ex Gagnep. in Ban Khao Wang, Ron Phibun, Nakhon Si Thammarat"

"Development of extraction methods and biological activity studies of *Amomum krervanh* Pierre ex Gagnep. for development as an anti-inflammatory product to promote the utilization of *Amomum krervanh* Pierre ex Gagnep. in Ban Khao Wang, Ron Phibun, Nakhon Si Thammarat", by Walailak University Drug and Cosmetics Excellence Center aimed to promote the Kravan Ban Khao Wang community enterprise to be an owner of spa massage oil products derived from Siam cardamom (*A. krervanh*) with high market values and commercial viability by cooperation with the government agencies, including the Plant Genetic Conservation Project Under the Royal Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn (RSPG) and the headman of Moo 12 village, Hin Tok Sub-district of Ron Phibun (Mr Taweepol Boonpol).

This project was led by Dr Bhudsaban Sukkarn, with staff from the School of Pharmacy with expertise in the related fields and pharmacy students who majored in industrial pharmacy. We worked with the Kravan Ban Khao Wang community enterprise members to develop a formula for a massage oil product from herbs found locally and are economic plants of the Ban Khao Wang community, including phlai (*Zingiber cassumunar* Roxb.) and Siam cardamom. Creating spa massage oil products derived from Siam cardamom will potentially result in job creation and increased income for community enterprise members, a group of farmers who produce and sell agricultural products of Siam cardamom. In addition, the spa massage oil product created from this project will cause an indirect impact on the Siam cardamom to be transformed from an intercropping plant in rubber plantations into a more robust economic crop for the Ban Khao Wang community prospectively.

This project was started by discussions with the village headman and president of the community enterprises to determine the type and analyze the feasibility of the product to be developed. Then, extracts from the Siam cardamom fruits were prepared using various methods, and the essential oil in the fruit appeared to inhibit inflammation either *in vitro* or *in vivo* (testing the analgesic effect in animal models is underway). This led to the development of a formula for herbal massage oil products to relieve aches and pains, which contained plai oil and wintergreen oil as the main ingredients; Siam cardamom oil was also used as a secondary ingredient and flavouring agent. The community enterprise members were allowed to participate in developing the herbal massage oil formula with a pleasurable

scent and sensation after applying it to the skin. They also participated in giving their opinions on the product's brand name and logo design.

The project has organized free-of-charge training workshops to transfer knowledge that will serve as a foundation for the community enterprise members of the Ban Khao Wang Krawan Group to produce and develop massage oil products from local herbs by themselves in the future. The transferred knowledge consists of 1) knowledge and process for extracting plai oil from plai rhizome using the rendering method, which uses heat to extract oil from plant tissue. Vegetable oil with a high boiling point (such as palm oil or coconut oil) is added during rendering to make the plai oil more easily extracted from plant tissue. Our recipe uses coconut oil. Others include 2) extraction of Siam cardamom oil by hydrodistillation method, 3) production of herbal massage oils, and 4) adjustment or modification of ingredients in herbal massage oil recipes to produce a satisfactory aroma and sensation.

In the training, participants gained knowledge and practised various skills through modern tools, technology, materials, and equipment available at the university at no cost. The project has also provided a “Handbook for Preparing Herbal Massage Oil Products” for the community enterprise members to quickly review knowledge and operate the production in line with what the project has developed. Fifth-year students majoring in industrial pharmacy also participated in this project; they prepared the cardamom essential oil for the training.

From following up after the training workshop was completed, the community members, especially those who are members of the community enterprise, have been found an increase in awareness of the health benefits of Siam cardamom, especially its anti-inflammatory properties. This will lead to a plan to develop spa massage oil products from Siam cardamom extract used for relieving aches and pains, which will become the following product produced by the Kravan Ban Khao Wang community enterprise.

This academic service activity aligns with **SDG 1.4.1** Local Start-up Assistance, **SDG 2.5.3** University Access to Local Farmers and Food Producers (15 members of Ban Khao Wang community enterprise), **SDG 2.5.1** Access to food security Knowledge (a free-of-charge workshop with the laboratories’ tools, technology, materials, and equipment of Walailak University), **SDG 3.3.2** Health Outreach Programmes (Knowledge of anti-inflammatory properties of Siam cardamom), **SDG 4.3.4** Education Outreach Activities beyond Campus (fifth-year students majoring in industrial pharmacy participated in the project), and **SDG 17.2.1** Relationships with the Government for SDG Policy (RSPG & the headman of Moo 12 village, Hin Tok Sub-district of Ron Phibun).

=====