

Development of Massage Oil product from Bang Chang Chili

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Abstract

This study aimed to develop a massage oil product from Bang Chang chili (*Capsicum annuum* var. *acuminatum*), a traditional cultivar native to Samut Songkhram province, Thailand. The chili samples were processed through drying, grinding, and extraction using two techniques: ethanol maceration and oil infusion. The extracted materials were incorporated into a massage oil formulation consisting of mineral oil, fragrance, and Tween 20 to enhance solubility and product stability. The results showed that both extraction methods produced chili extracts with distinct physical characteristics, with the oil infusion extract demonstrating superior compatibility with the carrier oil. The final product exhibited good homogeneity, color stability, and no phase separation during preliminary observations. Sensory evaluation indicated that the massage oil produced a mild warming sensation consistent with the known effects of capsaicin, contributing to muscle relaxation and potential pain relief. The findings highlight the potential of Bang Chang chili as a functional ingredient for therapeutic and wellness applications and emphasize its value in promoting local herbal product development. Notably, the formulation approach corresponds with the patented Bang Chang Chili Massage Oil innovation (Thai petty patent no. 2503002168), underscoring its novelty and practical relevance. Further research is recommended to evaluate long-term stability, quantify capsaicinoid content, and assess clinical efficacy to support future commercialization.

Keywords: Massage oil, Bang Chang chili, capsaicin, Thai traditional medicine, product development

1. Introduction

The therapeutic benefits of traditional Thai massage are often enhanced through the use of herbal oils, balms, and warm compresses. These preparations typically employ a carrier oil such as coconut or sesame oil infused with active botanical constituents. Medicinal plants including *Zingiber montanum* (plai), *turmeric* (*Curcuma longa*), and lemongrass are commonly selected for their anti-inflammatory, analgesic, and aromatherapeutic properties (Srisuk et al., 2018; Jariyapan & Rukshana, 2020). The integration of physical manipulation with topical herbal applications reflects a holistic approach aimed at promoting pain relief, reducing inflammation, and enhancing overall relaxation.

Although many traditional herbs used in Thai medicine have been extensively documented, emerging research continues to explore novel botanical ingredients. One such candidate is *Capsicum annuum* L. (chili pepper), whose principal bioactive compound, capsaicin, is a well-established topical analgesic. Capsaicin is widely incorporated into pharmaceutical formulations for the management of musculoskeletal and neuropathic pain, exerting its therapeutic effect through the defunctionalization of nociceptor fibers (Basith et al., 2021; Anand & Bley, 2011).

This research examines a local Thai cultivar, the Bang Chang chili (*C. annuum* var. *acuminatum*), traditionally grown in Samut Songkhram province. The research aims to develop a novel therapeutic massage oil derived from Bang Chang chili extract and to preferred anti-inflammatory activity by inhibiting albumin degradation (Thongkao, et al., 2024). and analgesic potential. The findings are expected to contribute to the advancement of Thai health and wellness products by validating the applicability of this regional botanical resource. However, the products to help society according to the sufficiency economy, keep generating higher incomes, expanding tourist attractions, and increasing community potential (Kakatum et al., 2021).

1.1 Research Objective

This study aimed to develop a massage oil formulation derived from Bang Chang chili extract.

2. Materials and methods

2.1 Sample preparation

2.1.1 Plant material

The cultivation of Bang Chang chili at Suan Sunandha Rajabhat University utilizes seeds sourced from the Tropical Vegetable Research and Development Center, Department of Horticulture, Faculty of Agriculture at Kamphaeng Saen, Kasetsart University, Kamphaeng Saen Campus. This process necessitates meticulous care, particularly in saline soil environments. The procedures encompass seed preparation, plot preparation, and management of the soil composition. A distinctive local wisdom technique, known as Yok Rong Jeen is employed in the cultivation. This method facilitates efficient water flow through the root system, preventing waterlogging while ensuring the soil remains fertile.



Figure 1. Bang Chang Chili

2.1.2 Extraction

The herbal material (chili) is dried using a hot air oven at a temperature of 50°C for 6 hours. The moisture content is measured to ensure it does not exceed 5%. The dried material is then coarsely ground using a powder grinder. Two extraction methods are employed Ethanol Maceration 500 g of the ground material are macerated in 5 L of 95% ethanol. The mixture is steeped for 3 days and subsequently filtered through Whatman No. 1 filter paper and Oil Infusion 500 g of chili powder are added to 1 L of heated rice bran oil. The mixture is simmered for 1 minute and then left to macerate infuse for 3 days and the oil fraction is filtered and separated for use in health and beauty products. The remaining solid residue is utilized to produce Nam Prik Pao (Thai chili paste), according to the components and procedures detailed subsequently.

2.1.3 Massage Oil product

The preparation of Bang Chang Chili Massage Oil begins by measuring the primary ingredient Mineral Oil (27 ml), which serves as the carrier oil. Following this, the active ingredient, Bang Chang Chili Extract Oil (1.5 ml), is incorporated into the base oil. Subsequently, to impart a pleasant aroma and ensure textural stability, 1 ml of Cosmetic Grade Fragrance and 0.5 ml of Tween 20 (which acts as a stabilizer or emulsifier) are added to the mixture. Once all components have been added, the mixture is stirred thoroughly until it is completely combined and homogenous. Finally, the finished massage oil is packaged into the prepared 30 ml pump bottles, making it ready for use.



Figure 2: Massage Oil product from Bang Chang Chili

3. Results and Discussions

The findings demonstrate that of Bang Chang chili using both ethanol maceration and oil infusion produced extracts with distinctly different physical characteristics. The ethanol extract yielded a dark red-brown solution with a strong pungent aroma, indicating a high concentration of capsaicinoids and phenolic compounds, consistent with findings reported by (Petcharaporn et al., 2023). However, the oil infusion method produced a lighter orange-red extract with a smoother texture, suggesting that the process primarily extracted lipid-soluble constituents such as capsaicin, dihydrocapsaicin, and essential oils. Therefore, Capsicum variety and temperature of extraction were also affected on their property (Thongkao, et al., 2023). The moisture content of the dried chili material, maintained below 5%, ensured minimal microbial contamination and improved extraction efficiency. These characteristics support the suitability of Bang Chang chili for incorporation into topical preparations due to its high capsaicinoid content. Bang Chang chili is a promising botanical resource for the development of topical therapeutic products. Both extraction methods provided bioactive-rich extracts suitable for cosmetic formulation; however, the oil infusion extract was particularly compatible with massage oil preparation due to its solubility and texture. The final product displayed desirable physical stability and consumer-acceptable sensory qualities, indicating successful formulation development. Importantly, the warming sensation produced by capsaicinoids may complement traditional Thai massage practices by enhancing blood circulation and promoting muscular relaxation. This study reinforces the potential of native chili cultivars to diversify the Thai herbal product market and provides preliminary evidence supporting the development of Bang Chang chili massage oil as a functional wellness product. Especially in the case of the formulation approach is aligned with the patented Bang Chang Chili Massage Oil innovation (Thai petty patent no. 2503002168), which further supports its novelty and practical applicability. Future studies should include quantitative analysis of capsaicin content, microbial stability testing, skin irritation assessments, and controlled clinical evaluation to substantiate its efficacy and safety.

4. Conclusion

This study successfully developed a massage oil formulation derived from the Bang Chang chili a traditional cultivar native to Samut Songkhram province. The extraction processes both ethanol maceration and oil infusion yielded chili extracts with desirable physical and chemical characteristics suitable for topical applications. The final massage oil formulation demonstrated good physical stability, homogeneity, and user acceptability, with the oil infusion extract showing particularly high compatibility with the carrier oil system. The product produced a mild warming sensation consistent with the known pharmacological effects of capsaicin, indicating its potential to support muscle relaxation and localized pain relief when used in conjunction with Thai massage practices.

Bang Chang chili is a viable and valuable ingredient for the development of therapeutic herbal products. Its incorporation into massage oil not only enhances the functional properties

of the formulation but also highlights the potential for community-level economic development through the utilization of local agricultural resources. Future research should expand upon these results by quantifying capsaicinoid content, conducting stability and safety testing, and evaluating clinical efficacy to fully establish the product's therapeutic potential and commercial feasibility.

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