การศึกษาฤทธิ์ทางชีวภาพเบื้องต้นต่อการชะลอวัยของสารสกัดเนระพูสี

The Preliminary Study of Biological Acitivities in Anti-aging of *Taccaceae chantrieri* ANDRE Extract

Pahol Sansomchai[1] Onuma Chansatein[2] Pattrawan Rodphet[3] Suwat Worratanakit[4]

บทคัดย่อ

ตั้งแต่มนุษย์มีการใช้สมุนไพรที่เป็นทรัพยากรโลกเพื่อสุขภาพ และความงาม ได้มีหลักฐานการใช้เนระพูสีเพื่อบำบัดโรคหลายชนิด การวิจัยนี้ให้ข้อมูลทางวิทยาศาสตร์ของสารสกัดเนระพูสีที่ปลูกในพื้นที่จังหวัดเชียงรายต่อฤทธิ์ทางชีวเภาพ และการต้านอนุมูลอิสระ นอกจากนี้ยังได้ศึกษาคุณสมบัติต่อการชะลอวัยในหลอดทดลอง ความสามารถในการต้านอนุมูลอิสระ ABTS ของสารสกัดเนระพูสีด้วยเอธานอลที่ความข้มข้น 100 ไมโครกรัม ต่อมิลลิลิตร มีความสามารถที่ร้อยละ 99.05 เมื่อเปรียบเทียบกับสารมาตรฐาน Trolox สำหรับความสามารถในการต้านอนุมูลอิสระ DPPH เท่ากับร้อยละ 99.43 เมื่อเปรียบเทียบกับสารมาตรฐานกรดแอสคอร์บิค สารสกัดเนระพูสีด้วยเอธานอลที่ความข้มข้น 1.0000 กรัม ต่อมิลลิลิตรมีปริมาณสารฟีนอลลิค เท่ากับแกลลิค แอสิด 95.01 ไมโครกรัม และมีปริมาณสารฟลาโวนอยด์เทียบเท่ากับสารคาเทชิน 18.61 ไมโครกรัม จึงมีความเป็นไปได้ว่าสารสกัดเนระพูสีควรมีการศึกษาในเชิงลึก เพื่อพัฒนาเป็นผลิตภัณฑ์อาหารเสริมเพื่อส่งเสริมสุขภาพการชะลอวัย

คำสำคัญ: สารสกัดเนระพูสี, ชะลอวัย, ฤทธิ์ทางชีวภาพ, ฤทธิ์ต้านอนุมูลอิสระ

Abstract

Since the herb was on earth to treatment human for good health and beauty. *Taccaceae chantrieri* ANDRE (Tacca) has an evidence that had been used for treatment various illnesses. This research gave a sciencetific data of biological activities and antioxidant activities found in Tacca extract,

---

[1*]Corresponding auther, Faculty of Medical Science, Nakhonratchasima college, Nakhon Ratchasima, Thailand, 30000, +66 915364266, lyw1149@gmail.com

[2]Co-auther, Faculty of Medical Science, Nakhonratchasima college, hydrophilic12@gmail.com

[3]Co-auther, Faculty of Medical Science, Nakhonratchasima college, pattrawan-bim@hotmail.com

cultivated in Chiang Rai Province and *in vitro* study on how it can promote anti-aging. The measurement of Tacca extract at 100 μg/ml in ethanol fraction on antioxidant activities against ABTS radicals was 99.06% as compared to Trolox. For antioxidant activities against DPPH radicals was 99.43% as compared to ascorbic acid. The total phenolics and total flavonoids at 100 μg/ml in ethanol fraction of Tacca extract were 95.01 GAE/g extract and 18.61 CE/g extract, respectively. In conclusion, Tacca extract could be further intensively studied and developed as anti-aging with promoting products or as a food supplements for health benefits.

Keywords: Tacca extract, anti-aging, biological activity, antioxidant activity

Statement and significance of problem

It is undeniable that health problem is one of a major obstruct for daily living. This problem affect human's health and personality. Natural product is significant for mankind. It is used as food, drink, cosmetic, and medicine. Several studies reveal that the natural products contain numerous biological effect including antioxidant, anti-cancer, anti-metastasis and anti-inflammation. In Thailand, many kind of natural products are used for disease treatment or preventing, as well as in an aspect of beauty such as rhizome herbs which contain active compounds that play roles in anti-oxidant, anti-aging, anti-inflamtory, and many biological activities. Moreover *Curcuma longa* also contains flavonoids (curcumin/curcuminoid) which protect against many cancer[1,2]. *Tacca chantrieri* Ander (Tacca) (Figure 1) was used in traditional medicine that contain active compound including, saponins (compesterol, spirostanol, arginin, etc), flavonoid, poly phenol, glycoside, and phenolic glycosides[3]. The biological activities of these herbal have been widely studied including, anti-oxidant, inhibition of lipidperoxidation and decrease blood sugar in diabetes patient[4], inhibition of virus and parasite growth, anti-inflammation, and anti-cancer[5].

However, the natural product has never been studied in the case of anti-aging related to its antioxidant activities. Tacca is only used as the traditional medicine for relieving the illness in the northern part of Thailand. Therefore, the study of anti-aging related to antioxidant activities in Tacca was conducted. The study aims at finding the medicinal plant extract that can protect against radical and lead to the development of the extracts for health promotion aspect.

Figure 1 *Tacca chantrieri* Ander

Objectives

- To extract *Taccaceae chantrieri* ANDRE (Tacca) by ethanol
- To study the antioxidant activities of Tacca extract
- To determine amount of anti-aging compound in Tacca extract

Materials and methods

Plant extraction: The rhizomes of *Taccaceae chantrieri* ANDRE were washed, ground, and dried to derived find powder. The power was subjected to maceration by 95% ethanol and partition by *n*-butanol to gave crude Tacca extract. Then, crude Tacca extract was dried by evaporation and lyophilization.

Antioxidant assays: Tacca extract was designed with various concentration to reduce the color of radical promotor (DPPH and ABTS radicals). The antioxidant activities were compare the standard reagents (ascorbic acid for DPPH assay, Trolox for ABTS assay).

Anti-aging related to antioxidant activities assay: The colorimetric methods were used to detect anti-aging realated to anti-oxidant activities. The total phenolic and flavonoid assays were compared to gallic acid and catechin standards, respectively. The folin-ciocalteu reagent was used for detect total phenolic compounds at OD 735 nm. For total flavonoids the standard catechin was compared to Tacca extract at OD 530 nm.

Results and Conclusions

The results of antioxidant activities were showed in Figure 2. The ethanolic Tacca extract at the concentration 100 μg/ml showed the best in antioxidant activities.

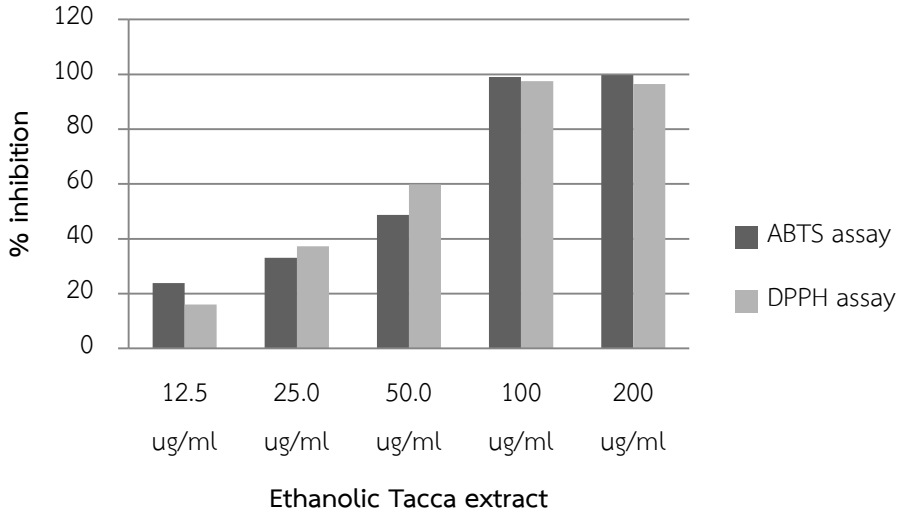

Figure 2. The antioxidant activities of ethanolic Tacca extract. The ABTS and DPPH radicals were reduced when the Tacca extract was added in the condition. The percent of inhibition of the oxidants were present. The percent of inhibition was dose dependent manner.

The anti-aging substances of ethanolic Tacca extract was show in Figure 3. The total phenolic and total flavonoid compounds were measured as an anti-aging related to antioxidant activities.

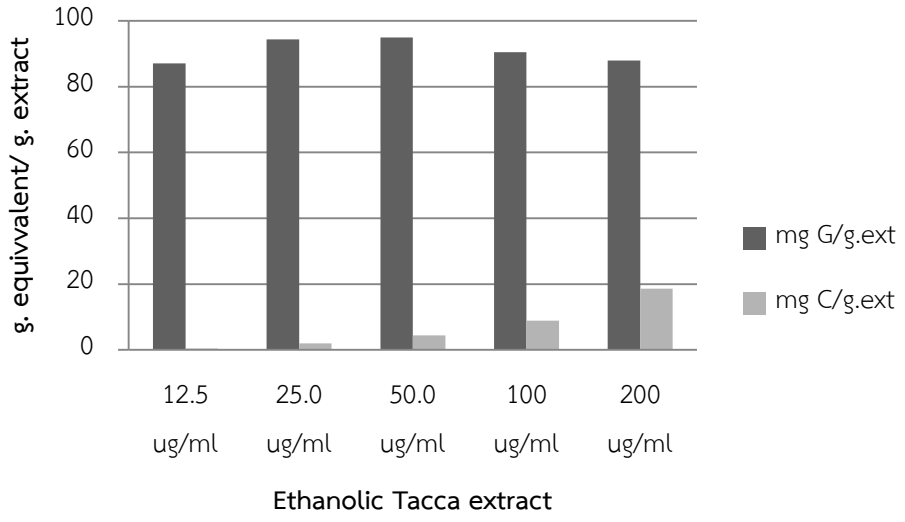

Figure 3. The anti-aging compounds as an antioxidant activities were investigated ethanolic Tacca extract. The total phenolic and flavonoid compounds were presentes in the ethanolic Taccca extract. The amount of anti-aging related to antioxidant activities were dose dependent manner.

Discussion

The ethanolic Tacca extract showed antioxidant activities. These activities were confirm by its phenolic and flavonoids compounds. These compounds are emphosise to be and anti-aging compound cause these compounds promote human health. Morover these compound also inhibit many causes of illness. Many scienctific study showed that benzoquinone-type retro-dihydrochalcone are extracted from root of Tacca can inhibit breast cancer, prostate cancer and cervical cancer[6]. Moreover, taccalonolides E and A, a steroid from this plant, can inhibit microtubule rearrangement[7] and inhibit expression of p-glycoprotein and inhibit MDR cancer cells proliferation[8]. Additionally, the ethanol fraction from Tacca can decrease blood pressure, relieve pain and anti-inflammation in animal model[9] but have no report *in vitro* study. For the study in skin and hair, found that Tacca could be used as an ingredient of shampoo for elimination of louse[10].

References

Sansomchai, P. (2014). **The Mechanisms of Dermal Papila cell Promoting Effects and Antioxidants of *Tacca chantrieri* Ander, *Centella asiatica* Linn), and *Eleutherine americana* (Aubl. Merr.) *in vitro***, Ph. D. Thesis. Phitsanulok: Thailand.

Yodkeeree, S., Chaiwangyen, W., Garbisa, S., & Limtrakul, P. (2009). **Curcumin, demethoxycurcumin and bisdemethoxycurcumin differentially inhibit cancer cell invasion through the down-regulation of MMPs and uPA**. *Journal of Nutritional Biochemistry*, *20*(2), 87-95. https://doi.org/10.1016/j.jnutbio.2007.12.003.

Yokosuka, A., & Mimaki, Y. (2007). **New glycosides from the rhizomes of Tacca chantrieri**. *Chemical & Pharmaceutical Bulletin (Tokyo), 55*(2), 273-279. http://dx.doi.org/10.1248/cpb.55.273.

Steinrut, L., Itharat, A., & Ruangnoo, S. (2011). **Free radical scavenging and lipid peroxidation of Thai medicinal plants used for diabetic treatment**. *Journal of the Medical Association of Thailand, 94*(7), S178-182. https://europepmc.org/abstract/med/22619926.

Yokosuka, A., Mimaki, Y., Sakuma, C., & Sashida, Y. (2005). **New glycosides of the campesterol derivative from the rhizomes of Tacca chantrieri**. *Steroids, 70*(4), 257-265. https://doi.org/10.1016/j.steroids.2004.11.006.

Peng, J., Jackson, E. M., Babinski, D. J., Risinger, A. L., Helms, G., Frantz, D. E., & Mooberry, S. L. (2010). **Evelynin, a cytotoxic benzoquinone-type Retro-dihydrochalcone from Tacca chantrieri**. *Journal of Natural Products, 73*(9), 1590-1592.https://pubs.acs.org/doi/abs/10.1021/np100350s.

Tinley, T. L., Randall-Hlubek, D. A., Leal, R. M., Jackson, E. M., Cessac, J. W., Quada, J. C., Jr., ... Mooberry, S. L. (2003). **Taccalonolides E and A: Plant-derived steroids with microtubule-stabilizing activity**. *Cancer Research, 63*(12), 3211-3220. https://pdfs.semanticscholar.org/6db4/bd9b695394e8319adba4aaa67fb7234153b9.pdf.

Risinger, A. L., Jackson, E. M., Polin, L. A., Helms, G. L., LeBoeuf, D. A., Joe, P. A., ... Mooberry, S. L. (2008). **The taccalonolides: microtubule stabilizers that circumvent clinically relevant taxane resistance mechanisms**. *Cancer Research, 68*(21), 8881-8888. http://cancerres.aacrjournals.org/content/68/21/8881 (doi: 10.1158/0008-5472.CAN-08-2037).

Tiamjan, R., Panthong, A., Taesotikul, T., Rujjanawate, C., Taylor, W. C., & Kanjanapothi, D. (2007). **Hypotensive Activity of Tacca chantrieri. and Its Hypotensive Principles**. *Pharmaceutical Biology, 45*(6), 481-485. https://doi.org/10.1080/13880200701389375.

Watcharawit, R., & Soonwera, M. (2013). **Pediculicidal effect of herbal shampoo against Pediculus humanus capitis in vitro**. *Tropical Biomedicine, 30*(2), 315-324. https://www.ncbi.nlm.nih.gov/pubmed/23959497.