

HERBISTHA Team

**Pinit K.
CEO.**



**R&D team and Manufacturing
Nanotec, NSTDA, Thailand**





Pinit KHUEANSUWONG

Education



Bachelor's Degree :
Engineering



Master's Degree :
Micro and Nanotechnologies

Experiences



Researcher
Commissariat à l'énergie atomique

energie atomique • énergies alternatives



Research Engineer
National Metal and Materials Technology Center

Present



Managing Director
Herbal Acharn's Home Co., Ltd.



Managing Director
idea2expert Co., Ltd.

Baby And Mother Care Market

อนาคตที่ดีของลูก
เริ่มต้นด้วยน้ำนมแม่

@thai108herb www.fenucap.com

สมุนไพรบ้านอาจารย์
Herbal Acharn's Home

ฟีนูแคป+
FENUCAPS PLUS
Dietary Supplement Product

อนิชา นิลพัชร์
พรีเซนเตอร์

12TH

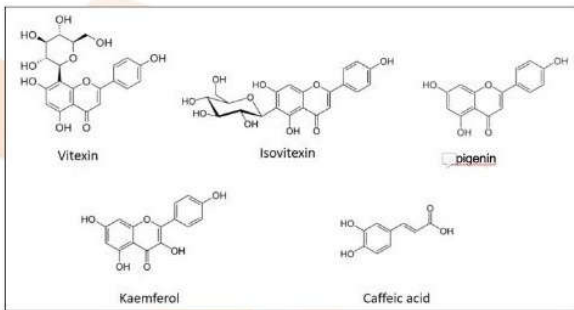
years

Since 2012

สมุนไพรบ้านอาจารย์
Herbal Acharn's Home

Thailand. • • •
Lao PDR.
Vietnam
Cambodia
Indonesia •
Sydney, Australia

สารสำคัญในเมล็ดลูกขี้



A Driving Force for National Science and Technology Capability



A Driving Force for National Science and Technology Capability



Our own Natural Farming, Since 2012



Natural Herb Farm



Extraction Technology



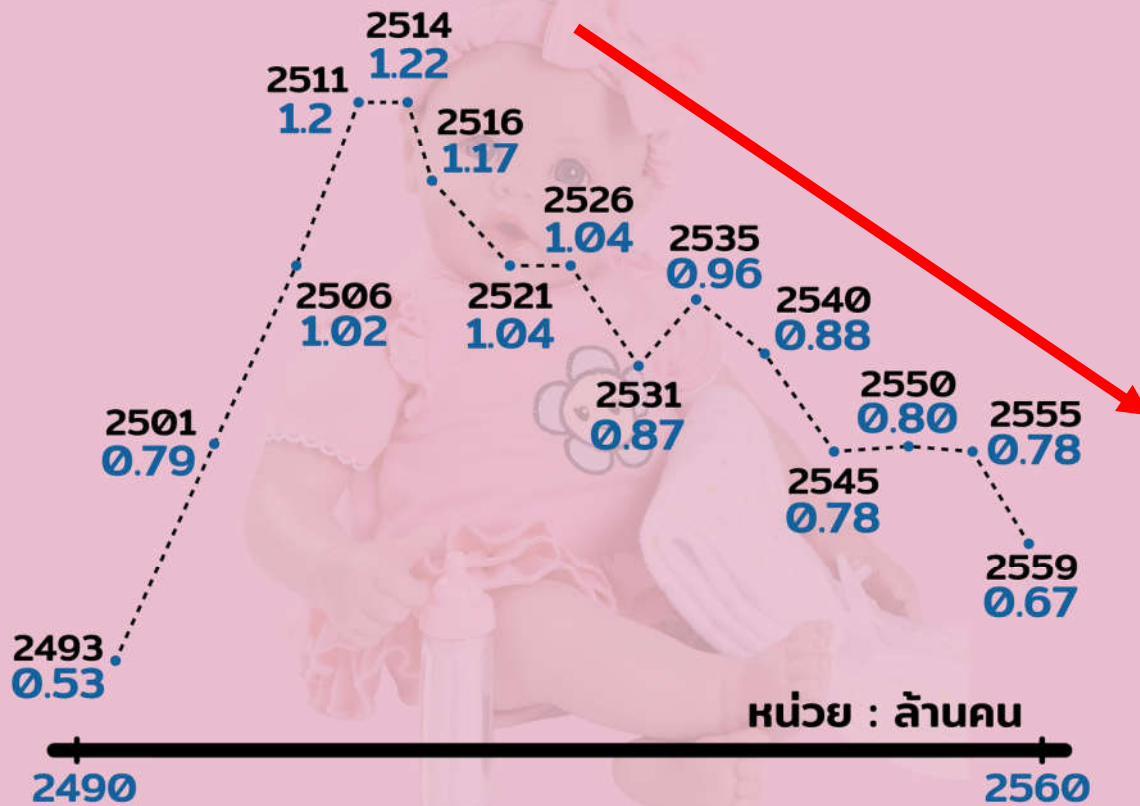


Breastfeeding Medicine , Newyork, US.

Ref: <https://www.ncbi.nlm.nih.gov/m/pubmed/30411974/>

ยุคเด็กไทยเกิดใหม่ไม่ถึงปีละล้าน

จำนวนเด็กเกิดใหม่ทั่วประเทศ พ.ศ. 2493 ถึง 2559



Tipping Point

Birth rate in Thailand
become lower 50%

ที่มา: 1. กองสถิติสาธารณสุข กระทรวงสาธารณสุข 2. สำนักงานสถิติแห่งชาติ

ประชาไท

Ref: <https://prachatai.com/journal/2018/01/74918>



LACTOLUXIN®

(lipniosome of fenugreek extract)

Research and Development by NANOTEC, NSTDA.

***2015-2016.**

Evaluation of biological activities of *Trigonella foenum-graecum* L. (Fenugreek) for cosmetic application

***2016-2017.**

Formulation Development of Nano-delivery system from fenugreek extract for anti-aging cosmetics

***2017-2019.**

Formulation Development of Anti-aging serum from lipniosome of fenugreek extract

***2019-2022.**

Formulation Development of SleepingMask from lipniosome of fenugreek extract

***2022-2024.**

Formulation Development of Sunscreen from lipniosome of fenugreek extract



Anti-aging ผลวิจัยๆ โดย Nanotec สวทช.



MED-P-04

Formulation and Characterization of Lipiosome Encapsulating Fenugreek Extract for Cosmeceutical Usages

Waleewan Eaknai*, Phichaporn Bunwatcharaphansakun, Mattaka Khongkow, Sasikarn Chairsi, Chutikorn Phungbun, Suwimon Boonrungsri, and Ubonthip Nimmannit

National Nanotechnology Center (NANOTEC), National Science and Technology Development Agency, Pathumthani, Thailand

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Trigonella foenum-graecum L. or fenugreek has been widely used to increase postnatal lactation and possessed various biological activities. In this work, we present a novel role and delivery system of fenugreek extract for cosmeceutical application. Briefly, the ethanolic extract of fenugreek seed powder from Herbal Acham's Home Co., Ltd was examined its biological activity, including DPPH radical scavenging ($IC_{50} = 1.20 \pm 0.02$ mg/mL) and anti-collagenase activity ($IC_{50} = 0.57 \pm 0.02$ mg/mL). We observed that the extract exhibits a novel cosmetic properties with a low in its physical stability. Therefore, nano-encapsulation was applied to resolve this problem. Lipiosome encapsulating fenugreek extract was formulated and kept at 4°C, 25°C and 40°C for three months to investigate its stability. The highly stable oval-shaped nanoparticles were obtained by the formation of phospholipid bilayers with an entrapment of fenugreek extract in the middle. The particle size was approximately 167.93-270.38 nm by DLS measurement. The percentage of entrapment efficiency (%EE) was 44.02-49.18% by UHPLC quantification using rutin as a standard marker. For cytotoxicity of these particles, MTT was performed and found that the lipiosome containing fenugreek was able to improve cell viability compared to blank lipiosome. All of these results suggest that lipiosome encapsulating fenugreek extract could be used as a new potential active anti-aging agent for cosmetic products.

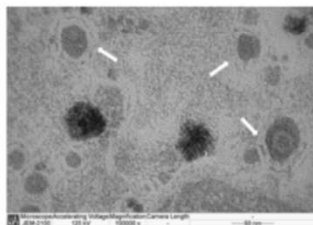


Figure 1. TEM image of lipiosome of fenugreek extract

Keywords: Fenugreek, Lipiosome, Anti-collagenase, Anti-aging, Rutin

References

1. S. A. Wani, P. Kumar, J. Saudi Soc Agri Sci. 2016, 17, 97-106.
2. M. Vinceković, M. Viskić, S. Jurić, J. Giacometti, D. B. Kovačević, P. Putnik, F. Donsl, F. J. Barba, A. R. Jambak, Trends Food Sci Technol. 2017, 69, 1-12



FORMULATION AND CHARACTERIZATION OF LIPIOSOME ENCAPSULATING FENUGREEK EXTRACT FOR COSMECEUTICAL USAGES

Waleewan Eaknai*, Phichaporn Bunwatcharaphansakun, Mattaka Khongkow, Sasikarn Chairsi, Chutikorn Phungbun, Suwimon Boonrungsri, and Ubonthip Nimmannit
National Nanotechnology Center (NANOTEC), National Science and Technology Development Agency, Pathumthani, Thailand
*e-mail: waleewan@nanotec.or.th

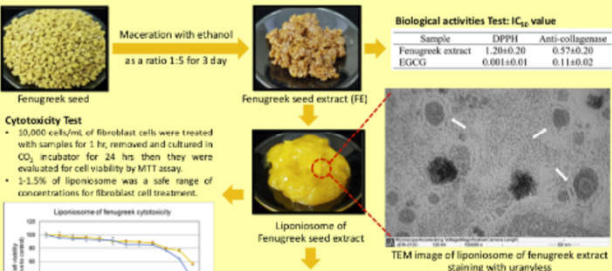
Abstract: *Trigonella foenum-graecum* L. or fenugreek has been widely used to increase postnatal lactation and possessed various biological activities. In this work, we present a novel role and delivery system of fenugreek extract for cosmeceutical application. Briefly, the ethanolic extract of fenugreek seed powder from Herbal Acham's Home Co., Ltd was examined its biological activity, including DPPH radical scavenging ($IC_{50} = 1.20 \pm 0.02$ mg/mL) and anti-collagenase activity ($IC_{50} = 0.57 \pm 0.02$ mg/mL). We observed that the extract exhibits a novel cosmetic properties with a low in its physical stability. Therefore, nano-encapsulation was applied to resolve this problem. Lipiosome encapsulating fenugreek extract was formulated and kept at 4°C, 25°C and 40°C for three months to investigate its stability. The highly stable oval-shaped nanoparticles were obtained by the formation of phospholipid bilayers with an entrapment of fenugreek extract in the middle. The particle size was approximately 167.93-270.38 nm by DLS measurement. The percentage of entrapment efficiency (%EE) was 44.02-49.18% by UHPLC quantification using rutin as a standard marker. For cytotoxicity of these particles, MTT was performed and found that the lipiosome containing fenugreek was able to improve cell viability compared to blank lipiosome. All of these results suggest that lipiosome encapsulating fenugreek extract could be used as a new potential active anti-aging agent for cosmetic products.

Introduction: Fenugreek (*Trigonella foenum-graecum* L.)

- A medicinal plant grow in Western Asia, Northern India, Northern Africa and Mediterranean
- It widely used in milk production agent (galactagogue)
- It possesses many biological activities, including, antioxidant, anti-diabetic and anti-cancer
- It composed of various types of chemical compounds such as vitamin, isovitexin quercetin and rutin



Methods and Results:



Cytotoxicity Test

- 50,000 cells/mL of fibroblast cells were treated with samples for 1 hr, removed and cultured in CO₂ incubator for 24 hrs then they were evaluated for cell viability by MTT assay.
- 1-1.5% of lipiosome was a safe range of concentrations for fibroblast cell treatment.

Stability Test: at 4, 25, 40 °C for 3 month

- Size and zeta were analysed using DLS technique
- Viscosity was measured using cone and plate rheometer (spindle: cp 40, 0.5 rpm, 20 ml)
- %Encapsulation Efficiency (%EE) was calculated using determination of rutin content in fenugreek extract by UHPLC technique

Conclusions: Fenugreek seed extract (FE) well known as an antioxidant agent in several reports except anti-wrinkle property. In this work, we successfully investigate that activity and entrap the extract into nanoparticle to increase stability and solubility. Formulated lipiosomes encapsulating FE are stable at 4°C, 25°C and 40°C for three months in term of particle size, zeta potential, pH, viscosity and %encapsulation Efficiency. These particles are safe for treating fibroblast cells at below 1.5% in formula. Therefore, lipiosome containing fenugreek extract can be used as an alternative active material for various cosmeceutical productions.

Condition	Month	Size	Zeta potential	pH	Viscosity	%EE
4°C	0	174.63±49.13	0.01±0.19	6.38±0.04	40930.70±46.13	46.67±7.37
	1	167.93±43.24	-7.00±11.11	6.40±0.01	40931.30±403.88	44.02±7.40
	2	218.25±49.07	-13.07±13.09	6.41±0.08	40843.52±114.56	47.61±4.23
25°C	0	184.08±32.51	-8.94±12.19	6.60±0.06	40931.28±276.85	44.14±3.34
	1	226.57±53.78	-6.65±12.70	6.48±0.09	40908.19±110.76	47.51±4.09
	2	242.91±98.47	-8.18±10.88	6.46±0.07	50116.75±140.97	40.77±4.14
40°C	0	241.71±80.47	-13.72±12.17	6.57±0.03	40908.64±139.52	48.72±3.35
	1	256.46±1.44	-16.03±13.84	6.51±0.04	50046.99±89.50	49.18±4.43
	2	227.87±62.39	-4.99±12.18	6.74±0.06	50033.36±30.21	48.51±0.68
	3	275.38±64.79	-7.05±13.39	6.73±0.03	40797.20±138.43	43.57±1.64

Acknowledgements: The authors are thankful to National Science and Technology Development Agency (NSTDA), Thailand for providing the laboratory facilities. They also sincerely thank Herbal Acham's Home Co., Ltd., Thailand for research funds and fenugreek seed powder sample.

References: 1. S. A. Wani, P. Kumar, J. Saudi Soc Agri Sci. 2016, 17, 97-106. 2. M. Vinceković, M. Viskić, S. Jurić, J. Giacometti, D. B. Kovačević, P. Putnik, F. Donsl, F. J. Barba, A. R. Jambak, Trends Food Sci Technol. 2017, 69, 1-12



Ethanollic Fenugreek Extract: Its Molecular Mechanisms against Skin Aging and the Enhanced Functions by Nanoencapsulation

by [Waleewan Eaknai](#), [Phichaporn Bunwatcharaphansakun](#), [Chutikorn Phungbun](#), [Angkana Jantimaporn](#), [Sasikan Chaisri](#), [Suwimon Boonrungsiman](#), [Ubonthip Nimmannit](#) and [Mattaka Khongkow](#)

Pharmaceuticals 2022, 15(2), 254; <https://doi.org/10.3390/ph15020254> (registering DOI) - 20 Feb 2022

Abstract Fenugreek, or *Trigonella foenum-graecum* L. (family Leguminosae) seeds, are typically used as food supplements to increase postnatal lactation. Fenugreek extract displays antioxidative and anti-inflammatory properties, but its mechanisms against skin aging have not been exploited. In this research, we are the first to [...] [Read more.](#)

(This article belongs to the Special Issue [Pharmaceuticals and Cosmeceuticals from Plants: Molecular Pharmacology and Toxicology](#))

▼ Show Figures

Journal Pharmaceuticals, Switzerland.



Lipionosome encapsulating fenugreek extract (LNF) facilitated a sustained release and significantly enhanced skin penetration. This nanoformulation helps to enhance the potency of fenugreek extract acting as an anti-aging agent by inducing collagen production and inhibiting UV-induced MMP1 and MMP9 releases in co-culture skin models.



ผลงานวิจัย สวทช. NANOTEC.

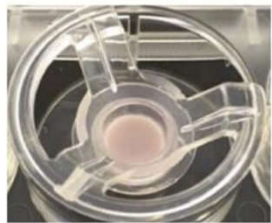
Innovated by **NSTDA**
 2022-01-000019
 20220201 | 20250131



ผลทดสอบทางคลินิก จากการใช้เซรั่มลดริ้วรอย บำรุงผิวหน้า

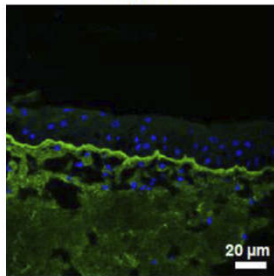


ภายใต้โครงการทดสอบผลิตภัณฑ์ งบประมาณสนับสนุนโครงการ iTAP สวทช. ทดสอบทางคลินิกโดยทีมแพทย์ผู้เชี่ยวชาญ ด้วยเครื่องมือวัดสภาพผิว, ร่องผิว และเครื่องมือวัดแรงตึงผิว ในอาสาสมัครกว่า 100 คน พบว่าริ้วรอยตื้นขึ้น และผิวมีความชุ่มชื้นมากขึ้น

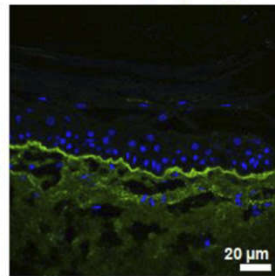


human 3D full-thickness skin model

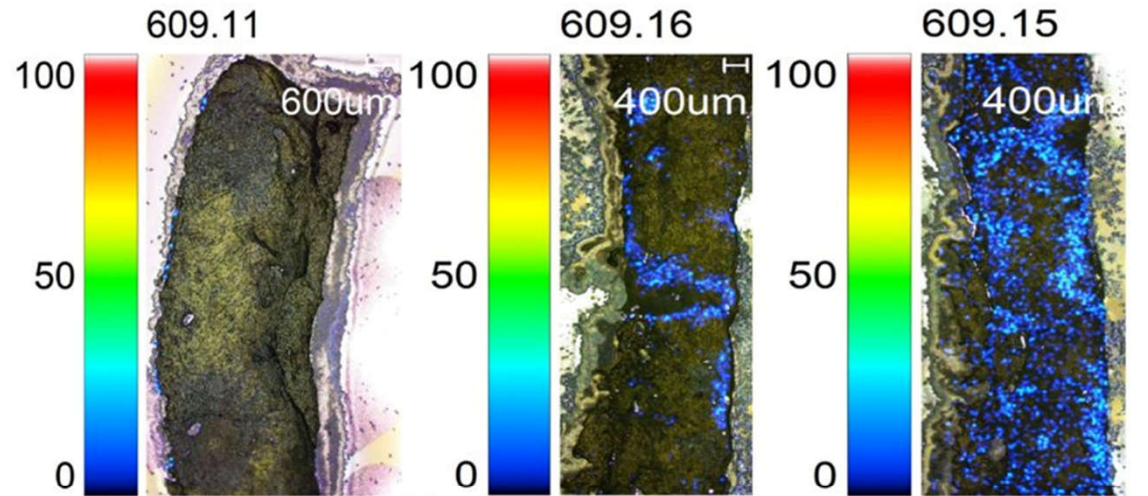
Product L



Herbistha ↑

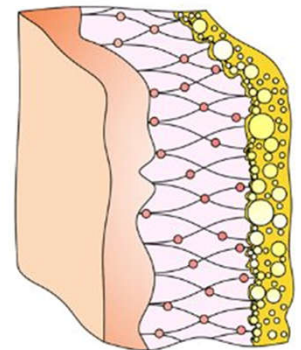


Methods and Results: Efficacy test



Imaging mass microscope (IMS) (SHIMADZU, model: iMScope TRIO)

LACTOLUXIN®



Collagen Production

ผลิตภัณฑ์ HERBISTHA® Serum วิจัยโดยทีมวิจัยนาโนเทคโนโลยีเพื่อคุณภาพชีวิตและเวชสำอางกลุ่มวิจัยการห่อหุ้มระดับนาโน, กลุ่มวิจัยการวิเคราะห์ระดับนาโนขั้นสูงและความปลอดภัย (ANCS,) ศูนย์นาโนเทคโนโลยีแห่งชาติ, NANOTEC, สวทช.

Herbistha Serum

เซรั่มยีน1 เรื่องริ้วรอย



ปลอดภัยด้วยสารสกัดจากเมล็ด
สนุนไฟรฟิวทริกจากธรรมชาติ
ช่วยชะลอการเกิดริ้วรอย



ส่วนประกอบสำคัญ LACTOLUXIN®
ทำให้ริ้วรอยตื้นขึ้น และเพิ่มความชุ่มชื้น
ขึ้นมากกว่า 60%



วิจัยและพัฒนาโดย Nanotec สวทช.
วัดและทดสอบทางคลินิก โดยอาสาสมัครกว่า 100 คน
ไม่มีสารที่เป็นอันตรายในสตรีมีครรภ์และให้นมบุตร

2020

2022

HERBISTHA

กู่หน้าไทร่มบำรุงในยามค่ำคืน!

'สลิปปีงมาสก์'

ฟื้นฟูเซลล์ผิว
เร่งด่วน

สารสกัดจาก
ธรรมชาติ

ล็อกความชุ่มชื้น
กว่า 2 เท่า



HERBISTHA® ผลงานวิจัยจาก ทีมวิจัยนาโนเทคโนโลยีชีวภาพเพื่อเวชสำอาง
กลุ่มวิจัยนาโนเทคโนโลยีชีวภาพในศูนย์วิจัยการวิจัยและพัฒนานวัตกรรมเวชสำอาง (ANCS)
ศูนย์นาโนเทคโนโลยีชีวภาพ (นาโนเทค) สำนักงานพัฒนาวิทยาศาสตร์และเทคโนโลยีแห่งชาติ (สวทช.)

SUNSCREEN | HERBISTHA



ปกป้องผิวจากรังสี UVA UVB

SPF50+
PA++++

50 ml.

2024

HERBISTHA Team



CEO
Pinit K.

R&D team
Nanotec



Manufacturing
GMP (INC-2)
NSTDA

