UNIVERSITI TEKNOLOGI MARA

The 11th International, Invention, Innovation & Design 2022

INDES 2022

Ushering in the Age of Endemic

THE 11TH INTERNATIONAL INNOVATION, INVENTION & DESIGN COMPETITION INDES 2022

EXTENDED ABSTRACTS BOOK

e ISSN 2756-8733

9 772756 873009

Perpustakaan Negara Malaysia Cataloguing in Publication Data

No e-ISSN: e-ISSN 2756-8733

Cover Design : Nazirul Mubin Mohd Nor
Typesetting : Wan Nurul Fatihah binti Wan Ismail

The 11th International Innovation, Invention and Design Competition 2022

Organised by

Office of Research, Industrial Linkages, Community & Alumni Networking (PJIM&A)
Universiti Teknologi MARA Perak Branch

and

Academy of Language Study
Universiti Teknologi MARA Perak Branch

NANOACTEEN: SILVER NANOPARTICLES HAND SANITIZER LOTION

Nur Maisarah Sarizan, Ahmad Suhail Khazali, Khairunnisa Ahmad Kamil,
Non Daina Masdar, Sarina Mohamad, Zainab Razali

Faculty of Applied Sciences, Universiti Teknologi MARA Perlis Branch, Arau Campus

Email: maisarahsarizan@uitm.edu.my

ABSTRACT

A person can become infected by touching their eyes, nose, or mouth after making contact with a contaminated surface. Therefore, keeping proper hand hygiene is crucial to avoid infections and other new health risks. There are various types of hand sanitizers available commercially, and using hand sanitizer regularly is necessary to maintain hand cleanliness. However, doing so may cause dryness or irritation to the skin. NanoActeen is a new formulation of hand sanitizer lotion that contains active ingredients named green synthesized-silver nanoparticles from snail mucin and mangosteen peel extract. It is a practical two-in-one daily moisturizer that not only hydrates dry skin but also kills bacteria when necessary. Silver nanoparticles (AgNPs) have gained much attention due to their unique properties which can be incorporated into antimicrobial applications and cosmetic products. Here, a nontoxic, eco-friendly, and cost-effective method has been established for the green synthesis of AgNPs using extracts of snail mucin (Achatina fulica) and mangosteen peel (Garcinia mangostana). These substances are claimed to have good antimicrobial properties, able in curing various diseases, slowing the aging process, and overcoming skin problems. Overall, NanoActeen has antimicrobial qualities that could kill viruses and bacteria while hydrating the skin and relieving mild skin irritation, making it an effective hand sanitizer lotion.

Keywords: antimicrobial, hand sanitizers, mangosteen peel, snail mucin, silver nanoparticles

1. INTRODUCTION

A recent study has shown that 80% of common infections are spread by hands (Koscova et al., 2018). Harmful bacteria and viruses, such as Salmonella, Campylobacter, Escherichia coli, Hepatitis A, and even COVID-19 may be found on almost anything we touch. These harmful bacteria/viruses may be carried by apparently healthy people, animals, or clean objects. Therefore, using hand sanitizer and washing hands regularly could prevent the spread of infectious diseases to others (Hadaway, 2020). However, excessive hand washing and overuse of hand sanitizer can lead to dry, cracked skin as well as redness or discoloration, and flaking (Bhoge et al., 2021). Thus, NanoActeen, a practical two-in-one daily moisturizer is proposed that not only hydrates dry skin but also could eliminate bacteria/viruses.

This new hand-sanitizing lotion contains silver nanoparticles (AgNPs) is developed from extracts of snail mucus (Achatina fulica) and mangosteen peel (Garcinia mangostana). AgNPs have gained much attention due to their unique properties which can be incorporated into antimicrobial applications and cosmetic products (Sharma et al., 2021). Generally, snail mucin is already well-known as a popular skin-care ingredient that contains allantoin, collagen, elastin, glycolic acid, hyaluronic acid, and natural antibacterials (Cilia & Fratini, 2018). Besides

that, the snail mucin also encourages wound healing and tissue repair (Wu et al., 2020). In addition, mangosteen peel extract is rich in antioxidants, antimicrobial, and xanthone substances. These substances are claimed to cure various diseases, overcome skin problems, and slow the aging process (Rizaldy et al., 2021).

2. METHODOLOGY

The development of NanoActeen consists of four important phases which are sample preparation, sample extraction and development of AgNPs, sample formulation, and sample production (Figure 1).

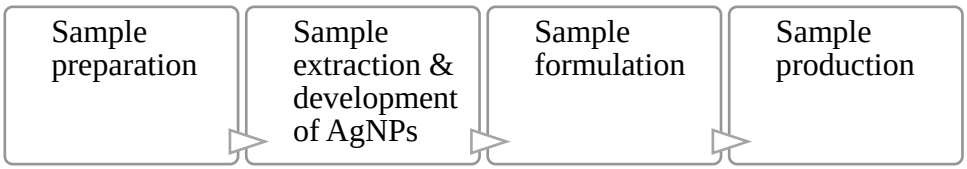

Figure 1 Development of NanoActeen

NanoActeen is a new formulation of hand sanitizer lotion that contains active ingredients which are the green synthesized-AgNPs from snail mucin (A. fulica) and mangosteen peel (G. mangostana) extracts.

3. FINDINGS

The green synthesized-silver nanoparticles from snail mucus and mangosteen peels are the active ingredients in NanoActeen, a new type of hand sanitizer lotion. It is a useful two-in-one daily moisturizer that, in addition to hydrating dry skin, can occasionally kill microorganisms. Due to their special characteristics, which can be incorporated into antibacterial applications and cosmetic items, AgNPs have attracted a lot of attention. Here, a method for the environmentally friendly synthesis of AgNPs employing extracts of snail mucus (A. fulica) and mangosteen peel (G. mangostana) has been developed. These compounds are claimed as having strong antibacterial characteristics, being able to treat a number of illnesses, delay aging, and solve skin issues.

4. CONCLUSION

A non-toxic, eco-friendly, and cost-effective method has been established for the green synthesis of AgNPs using extracts of snail mucin (A. fulica) and mangosteen peel (G. mangostana) which contained good antimicrobial properties. Overall, NanoActeen has antimicrobial qualities that could kill viruses and bacteria while hydrating the skin and relieving mild skin irritation, making it an effective hand sanitizer lotion.

REFERENCES

Bhoge, M. S., Bavage, S. B., & Bavage, N. B. (2021). Evaluation and formulation of herbal hand sanitizer. *International Journal of Research Publication and Reviews*, 2(10): 784-786.

Cilia, G., & Fratini, F. (2018). Antimicrobial properties of terrestrial snail and slug mucus. *Journal of Complementary and Integrative Medicine*, 15(3).

Hadaway, A. (2020). Handwashing: Clean hands save lives. *Journal of Consumer Health on the Internet*, 24(1), 43-49.

Koscova, J., Hurnikova, Z., & Pistl, J. (2018). Degree of bacterial contamination of mobile phone and computer keyboard surfaces and efficacy of disinfection with chlorhexidine digluconate and triclosan to its reduction. *International Journal of Environmental Research and Public Health*, 15(10), 2238.

Rizaldy, D., Hartati, R., Nadhifa, T., & Fidrianny, I. (2021). Chemical compounds and pharmacological activities of mangosteen (*Garcinia mangostan*a L.) - updated review. *Biointerface Research in Applied Chemistry*, 12, 2503-2516.

Sharma, D., Gulati, S. S., Sharma, N., & Chaudhary, A. (2021). Sustainable synthesis of silver nanoparticles using various biological sources and waste materials: A review. *Emergent Materials*, 1-30.

Wu, Y., Zhou, Z., Luo, L., Tao, M., Chang, X., Yang, L. & Wu, M. (2020). A non-anticoagulant heparin-like snail glycosaminoglycan promotes healing of diabetic wound. *Carbohydrate Polymers*, 247, 116682.

Pejabat Perpustakaan
Librarian Office

Universiti Teknologi MARA
Cawangan Perak
Kampus Seri Iskandar
32610 Bandar Baru Seri Iskandar,
Perak Darul Ridzuan, MALAYSIA
Tel: (+605) 374 2093/2453 Faks: (+605) 374 2299

UNIVERSITI TEKNOLOGI MARA

Surat kami : 700-KPK (PRP.UP.1/20/1)
Tarikh : 20 Januari 2023

UNIVERSITI TEKNOLOGI MARA PERAK
TERIMA
25 JAN 2023
Tindakan
Universiti Teknologi MARA Perak
PEJABAT REKTOR

Prof. Madya Dr. Nur Hisham Ibrahim
Rektor
Universiti Teknologi MARA
Cawangan Perak

Tuan,

PERMOHONAN KELULUSAN MEMUAT NAIK PENERBITAN UiTM CAWANGAN PERAK MELALUI REPOSITORI INSTITUSI UiTM (IR)

Perkara di atas adalah dirujuk.

2. Adalah dimaklumkan bahawa pihak kami ingin memohon kelulusan tuan untuk mengimbas (*digitize*) dan memuat naik semua jenis penerbitan di bawah UiTM Cawangan Perak melalui Repositori Institusi UiTM, PTAR.

3. Tujuan permohonan ini adalah bagi membolehkan akses yang lebih meluas oleh pengguna perpustakaan terhadap semua maklumat yang terkandung di dalam penerbitan melalui laman Web PTAR UiTM Cawangan Perak.

Kelulusan daripada pihak tuan dalam perkara ini amat dihargai.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menjalankan amanah,

SITI BASRIYAH SHAIK BAHARUDIN
Timbalan Ketua Pustakawan

nar

Setuju.

27.1.2023

PROF. MADYA DR. NUR HISHAM IBRAHIM
REKTOR
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PERAK
KAMPUS SERI ISKANDAR