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(Approved by AICTE, New Delhi, Recognised by Govt. of Karnataka and Affiliated to Visvesvaraya Technological University, Belagavi)

2018-19

International Journal of Pharmacy and Biological Sciences
ISSN: 2321-3272 (Print), ISSN: 2230-7605 (Online)
IJPBS™ | Volume 8 | Issue 4 | OCT-DEC | 2018 | 671-681
Research Article | Biological Sciences | Open Access | MCI Approved| ज्ञान-विज्ञान विमुक्तये
|UGC Approved Journal |

DETERMINING THE *IN-VITRO* CHOLESTEROL-REDUCING EFFICIENCY OF LACTOBACILLUS AND ENTEROCOCCUS STRAINS ISOLATEDFROM HUMAN BREAST MILK, FECES OF BREAST-FED INFANTS AND ANIMAL MILK (GOAT, COW AND BUFFALO)

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ABSTRACT

The present study was designed to evaluate the cholesterol-removal efficacy in-vitro of four Lactobacillus and four Enterococcus strains. All 8 isolates exhibited Bile Salt Hydrolase (BSH) activity (1.64 to 3.09 mm of precipitation zone) and cholesterol assimilation with and without bile salt (7.7% to 95.58%) but significantly higher-cholesterol assimilation was observed with bile salts (9.157% to 95.58%), Among these NB 16 and NB12 isolates manifested significantly higher cholesterol assimilation superior to other 6isolates with deoxycholic acid (95.58% and 94.85%) and cholic acid (92.17% and 88.9%) than ox bile and TDCA, and also exhibited a high cholesterol reduction ability in natural [egg yolk (NB7-34.46% to NB16-73.82%) and skimmed milk (NB7-28.22% to NB16-72.88%)] cholesterol media than synthetic cholesterol media without bile salt and cholesterol reduction potential by the 8 isolates were optimized by different cultural conditions, among these NB16 displayed an elevated cholesterol removal ability with 83.51% at1%inoculum size, 83.9% at 24 h inoculums age., 83% at pH-7, 83.17% at 37°C incubation temperature, 83.27% at 24 h incubation time and 83.51% at 70 µg/ ml cholesterol concentration these probiotic strain could be exploited as a potential biotherapeutic agent to reduce cholesterol levels and the risk of cardiovascular diseases.

KEY WORDS

Bile salt hydrolase, Cholesterol- lowering effect, Enterococcus faecium, Lactobacillus para casei.

I. INTRODUCTION

Cholesterol is a vital structural component of the animal cell membrane [1] and its imbalance in the blood is called hypercholesterolemia which is a leading risk aspect for cardiovascular diseases and also the main cause of death [2]. It may be averted by practicing drug therapies but usually, they possess undesirable side effects certain as gastrointestinal discomfort [3]. Hence, necessity is there for more natural approaches among which dietary intervention using probiotics have potent health-promoting benefits namely bio therapeutic agents [4, 5]. Previous studies have stated that total and low-density lipoprotein (LDL-C) cholesterol decreased by probiotics in which it was strongly related with elevated CVD risks. Due to it has led to an improved interest in probiotics as it was much less expensive then should be considered a "natural health remedy" [6].

In the 1970s experimental reports have stated that wild *Lactobacillus* strain have a cholesterol removal effect in human beings [7], after that many *in vitro* and *in vivo*

International Journal of Pharmacy and Biological Sciences
ISSN: 2321-3272 (Print), ISSN: 2230-7605 (Online)
IJPBS™ | Volume 8 | Issue 4 | OCT-DEC | 2018 | 787-799
Research Article | Biological Sciences | Open Access | MCI Approved| ज्ञान-विज्ञान विमुक्तये
|UGC Approved Journal |

IN VITRO SCREENING OF THE PROBIOTIC POTENTIAL OF *LACTOBACILLUS* AND *ENTEROCOCCUS* STRAINS ISOLATED FROM HUMAN BREAST MILK, FECES OF BREAST-FED INFANTS AND ANIMAL MILK (GOAT, COW AND BUFFALO)

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ABSTRACT

This study sought to investigate the probiotic potent of lactic acid bacteria isolated from animal raw milk, human breast milk and infant fecal matter. A total of 200 LAB strains have been isolated, among this four Lactobacillus spp and four Enterococcus spp. have been screened for their functional properties, among these Lactobacillus para casei NB16 isolated from human breast milk was capable to survive at 1% bile salt, pH 2.0 and SGJ for 4 h without losing viability and ability to grow in a range of temperatures at15- 50°C, pH 3-9 and salt concentration up to 8 %. All LAB strains exhibited inhibitory activity towards wide range of food borne pathogens, in addition, NB12, and NB16 have been found to be resistant to 16 antibiotics out of 17 except Chloramphenicol and fermented 17 sugars out 20. Adhesion percentage of 8 isolates to Hydrocarbons up to (96%), auto-aggregation up to (90%) and co-aggregation with Escherichia coli MTCC 40 up to (62%) was observed and 16S rDNA sequence confirmed NB12, NB 14, NB 113 as Lactobacillus para casei, NB16 as Lactobacillus casei, NB10, NB44, NB94 as Enterococcus faecium and NB7 as Enterococcus faecalis respectively. Probiotic functional properties of isolates have been characterized and isolates were identified by using molecular methods.

KEY WORDS

Enterococcus faecalis, Feces of breastfed infants, Human breast milk, Lactobacillus casei.

I. INTRODUCTION

Human beings and animals use probiotics as a part of the healthy diet to have safe, natural and effective health-promoting benefits [1, 2, 3]. According to the definition by the World Health Organization (WHO), "live microorganisms which when administered in adequate amounts confer a health benefit on the host" [4, 5, 6]. The genera of *Lactobacillus, Lactococcus, Bifidobacteria, Streptococcus, Enterococcus, Saccharomyces* and numerous strains of yeast have been considered as probiotics [1, 7, 8]. However, lactic acid bacteria are considered as the main group of probiotics. Several species of these genera are "Generally Recognized as Safe (GRAS)" by the FDA (US food and drug administration) and they are technologically appropriate for industrial approaches [1, 9].

To date, several lactic acid bacterial species have been isolated from the dairy products. The investigations have revealed that the infectious disorders decreased

International Journal of Pharmacy and Biological Sciences
ISSN: 2321-3272 (Print), ISSN: 2230-7605 (Online)
IJPBS™ | Volume 8 | Issue 4 | OCT-DEC | 2018 | 379-383
Research Article | Biological Sciences | Open Access | MCI Approved| ज्ञान-विज्ञान विमुक्तये
|UGC Approved Journal |

SYNTHESIS OF GOLD NANOPARTICLES BY THE FLOWER EXTRACTS OF *TABEBUIA ARGENTIEA* AND THEIR ANTIOXIDANT ACTIVITY

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ABSTRACT

Biosynthesis of nanoparticles by plant extracts is currently under exploitation. Plant extracts are very cost effective and eco-friendly and thus can be an economic and efficient alternative for the large-scale synthesis of nanoparticles. The current study revealed that the aqueous flower extracts of Tabebuia argentiea were used and compared for their extracellular synthesis of gold nano-particles. Stable gold nanaoparticles were formed by treating aqueous solution of $AuCl_3$ with the plant flower extracts. The formed gold nano-particles were characterized by scanning electron microscopy (SEM) and energy-dispersive X-ray spectroscopy (EDX). The flower extracts act as reducing as well as encapsulating agent for the gold nanoparticles. The SEM revealed the formation of spherical gold nanoparticles with the average particles size of 56 nm. Antioxidant activity of gold nanoparticles was carried out and found to be more significant antioxidants.

KEY WORDS

Gold nanoparticles, Chloroauric acid, SEM, EDX, Antioxidant activity

INTRODUCTION

Nanotechnology is gaining tremendous impacts in the present century due to its capability of modulating metals into their nano size. Plant/Flower extracts are very cost effective and eco-friendly and thus can be an economic and efficient alternative for the large-scale synthesis of nanoparticles [1]. With the advancement of technologies and superior scientific understanding paved a way for research and development in the plant biology towards intersection of nanotechnology. Nanoparticles are of numerous scientific interests as they are effectively a bridge between bulk materials and atomic or molecular structures. It is cost effective and less tedious purification steps [2]. Biological mediated synthesized gold nanoparticles (GNPs) are have extensive applications in the biosensing, catalytic, drug delivery, therapeutic and diagnostic fields [3-7].

Tabebuia argentea (Bignoniacae) is a large and yellow flowering tree and it is contained with phenolic and poliophenolic compounds. Phenolic compounds can be used as cytotoxic, antimicrobial and antifungal agents [8]. To the best of our knowledge, GNPs synthesis by *Tabubea argentea* is reported for the first time by reducing a solution of gold chloride. In our study we report a yellow method for the synthesis of gold nanoparticles at room temperature by using flower extracts of *Tabubea argentea* as readucing / stabilizing

Research Article 2019, 10(11), 844-849 Advanced Materials Letters

Green Synthesis and Characterization of Silver Nanoparticles using *Cassia auriculata* Leaves Extract and Its Efficacy as A Potential Antibacterial and Cytotoxic Effect

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Received: 21 May 2019, Revised: 28 June 2019 and Accepted: 02 July 2019

DOI: 10.5185/amlett.2019.0046
www.vbripress.com/aml

Abstract

Silver nanoparticles (Ag NPs) were prepared using *Cassia auriculata* leaves extract as a reducing agent via green synthesis method. From the PXRD, UV-Visible, FTIR, studies the synthesized NPs were characterized. The morphologies of the prepared NPs were studied by SEM and TEM analysis. The synthesized NPs were tested for antibacterial and anticancer studies. The PXRD data indicated that the synthesized nanoparticles belong to cubic phase structure. Presence of strong silver peaks was confirmed by EDAX studies. The SEM and TEM data revealed that spherical like structure were obtained. Antibacterial (MIC from 75 to 150 µl) activities were noticed for green synthesized Ag NPs. Furthermore, *in vitro* studies revealed dose-dependent cytotoxic effects of Ag NPs treated PC-3 cell line. This is the first report on the green synthesis of Ag NPs using leaves extract of *C. auriculata*. Results of present study could contribute to synthesize new and cost-effective drugs from *C. auriculata* by using green approach. Copyright © VBRI Press.

Keywords: Green synthesis, *Cassia auriculata*, silver nanoparticles, antibacterial, anticancer.

Introduction

Nanoparticles are usually categorized as materials

Cancer is one of the leading diseases which will cause global death rates up to 15 million by 2020 and is

IOP Publishing | Vietnam Academy of Science and Technology Advances in Natural Sciences: Nanoscience and Nanotechnology

Adv. Nat. Sci.: Nanosci. Nanotechnol. **10** (2019) 035010 (8pp) https://doi.org/10.1088/2043-6254/ab38b0

Endophytic fungus *Alternaria* spp isolated from *Rauvolfia tetraphylla* root arbitrate synthesis of gold nanoparticles and evaluation of their antibacterial, antioxidant and antimitotic activities

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Received 15 April 2019
Accepted for publication 7 July 2019
Published 29 August 2019

Abstract

In our present study, we have developed a new, endophytic mediated technique for the synthesis of gold nanoparticles (AuNPs) from the endophytic fungus *Alternaria* spp. extract isolated from *Rauvolfia tetraphylla* root. The synthesized AuNPs were characterized using Ultraviolet-visible

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Research Article

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Ixora coccinea extract-mediated green synthesis of silver nanoparticles: Photodegradative and antimicrobial studies

Abstract

Silver nanoparticles (Ag NPs) was synthesized by green synthesis method using Ixora coccinea leaves extract as fuel. The structure and morphology of the product were characterized by Powder X-ray Diffraction, UV - Visible spectroscopy, Scanning Electron Microscopy and Transmission Electron Microscopy. The nanoparticles (NPs) were subjected to photocatalytic and antimicrobial studies. PXRD pattern demonstrates that the formed product belongs to the cubic crystal system. SEM images show that the particles are agglomerated to form spherical like structure and the average crystallite sizes were found to be 20nm. The prepared Ag NPs exhibit excellent photocatalytic activity for the photodegradation of methylene blue (MB) indicating that the Ag NPs are potential photocatalytic semiconductor materials. Ag NPs exhibit significant bactericidal activity against gram-positive (Pseudomonas aeruginosa, Escherichia coli and Klebsiella acrogenes) and gram-negative (Staphylococcus aureus) bacteria using the disc diffusion method. The study successfully demonstrates the synthesis of Ag NPs by simple eco-friendly route employing Ixora coccinea as a fuel that exhibits superior Photodegradative and antibacterial activities.

Keywords: green synthesis, Ixora coccinea, photocatalyst, dye degradation, antibacterial

Volume 5 Issue 4 - 2019

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Received: May 24, 2019 | **Published:** July 11, 2019

Introduction

In recent years, nanomaterials have been broadly studied compared to their huge materials due to their interesting physio-chemical properties.[1] Presently, the photocatalytic degradation has much alarming technique green-assisted technology for making free from organic and inorganic toxic pollutants in wastewater. Semiconductor

Journal of Cluster Science (2019) 30:1545–1564
https://doi.org/10.1007/s10876-019-01598-5

ORIGINAL PAPER

Rauvolfia tetraphylla (Devil Pepper)-Mediated Green Synthesis of Ag Nanoparticles: Applications to Anticancer, Antioxidant and Antimitotic

S. P. Vinay[1] · Udayabhanu[2] · G. Nagaraju[2] · C. P. Chandrappa[3] · N. Chandrasekhar[1]

Received: 2 March 2019 / Published online: 30 May 2019

Abstract

In the current examination, we have built up a novel, green approach for the synthesis of Ag NPs (silver nanoparticles) from *Rauvolfia tetraphylla* leaves extract. The synthesized Ag NPs were thoroughly characterized using different analytical techniques like Powder X-ray diffraction, Fourier transform infrared spectroscopy, UV–visible spectroscopy, scanning electron microscopy and transmission electron microscope analysis. It is confirmed as a cubic phased silver nanoparticle with an average particle size of around 40 nm with a spherical shape. Further, the characterized material was examined for antioxidant activity and it has shown the IC_{50} (inhibitory concentration 50%) value of 82.13 µg/mL against the scavenging of DPPH free radical. The cytogenetic effect of silver nanoparticles was tested on the root cells of *Allium cepa*, from this examination we have noted the antimitotic activity and precise chromosomal aberrations such as chromosome-breaks, chromosome-stickiness, laggard chromosome, clumped chromosome etc. By discharging Ag^+ ions and producing ROS, silver nanoparticle exhibits great anticancer activity. Therefore, this paperwork effectively shows the synthesis of Ag nanoparticles by simple eco-friendly green way utilizing *Rauvolfia tetraphylla* leaves to extract as a green reducing agent as well as stabilizing/capping agent for the synthesis of Ag NPs.

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Materials Today: Proceedings 9 (2019) 499–505

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Facile Green Chemistry Synthesis of Ag Nanoparticles Using *Areca Catechu* Extracts for the Antimicrobial Activity and Photocatalytic Degradation of Methylene Blue Dye

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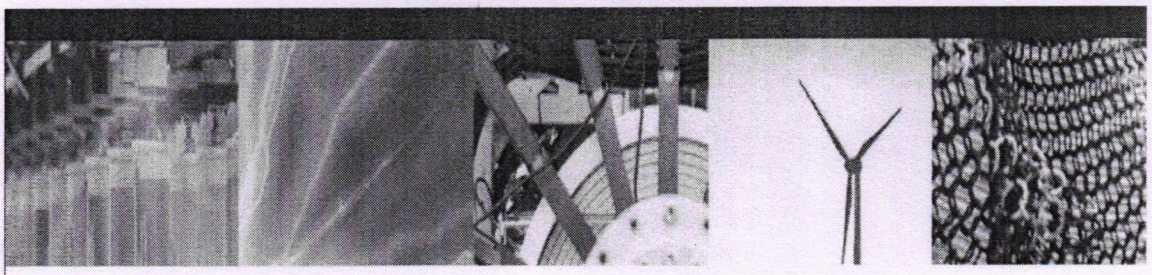
Abstract

Green synthesis of silver nanoparticles (Ag NPs) using *Areca catechu* extract as reducing agent was investigated. The bioreduction of silver ions into silver nanoparticles was monitored using UV-visible spectrophotometry. The synthesized Ag NPs were studied by Fourier transform infra-red spectroscopy (FTIR), UV–visible spectroscopy, Transmission electron microscopy (TEM) analysis, Energy dispersive X-ray analysis (EDX) and X-ray diffraction (XRD) techniques. The photocatalytic degradation of methylene blue was estimated spectrophotometrically using the green synthesized silver (Ag) as nanocatalyst. Disc diffusion method was used to investigate the antimicrobial properties of the Ag NPs against the tested bacterial strains.



Research Article

Enhanced photocatalysis, photoluminescence, and anti-bacterial activities of nanosize Ag: green synthesized via *Rauvolfia tetraphylla* (devil pepper)

S. P. Vinay[1] · Udayabhanu[2] · G. Nagarju[2] · C. P. Chandrappa[3] · N. Chandrasekhar[1]

Abstract

In the current study, we have built up a novel, green approach technique for the synthesis of silver nanoparticles (Ag NPs) from *Rauvolfia tetraphylla* leaves extract. The synthesized nanoparticles were thoroughly characterized using different analytical techniques like X-ray diffraction, Fourier transform infrared spectroscopy, UV–Vis spectroscopy (UV–Vis), scanning electron microscopy, energy-dispersive X-ray spectroscopy and transmission electron microscope analysis. It is confirmed as a cubic phase with average particle size about 40 nm with a spherical shape. Further, the characterized material was inspected for the photocatalytic degradation of most common environmental pollutants (carcinogenic organic dyes) like Methylene blue (M.B), Rhodamine B (Rh. B) and Rose bengal (R.B) with degradation efficiency of 81, 55 and 80% respectively. In addition, it was examined by optical property (photoluminescence) with blue emission by the excitation at 370 to 400 nm, which is useful for blue LEDs (light emitting diode). Furthermore, it also shows the superior anti-bacterial activity against gram-positive bacterias such as *Pseudomonas aeruginosa*, *Escherichia coli* and *Klebsiella aerogenes* and gram-negative bacteria *Staphylococcus aureus*. Ag NPs synthesized using *Rauvolfia tetraphylla* leaf extract exhibited a good photocatalytic and antibacterial activity. Hence, it's a first to report the synthesis of Ag NPs using natural reducing agent *Rauvolfia tetraphylla* leaf extract for Luminescence and Dye degradation applications.