



DETERMINING THE *IN-VITRO* CHOLESTEROL-REDUCING EFFICIENCY 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

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 6 isolates 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% at 1% inoculum size, 83.9% at 24 h inoculum 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 than 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*



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 at 15- 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



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 argentea* were used and compared for their extracellular synthesis of gold nano-particles. Stable gold nanoparticles were formed by treating aqueous solution of AuCl₃ 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 nanoparticles¹. 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 steps². Biological mediated synthesized gold nanoparticles (GNPs) are have extensive applications in the biosensing, catalytic, drug delivery, therapeutic and diagnostic fields³⁻⁷.

Tabebuia argentea (Bignoniaceae) is a large and yellow flowering tree and it is contained with phenolic and polyphenolic compounds. Phenolic compounds can be used as cytotoxic, antimicrobial and antifungal agents⁸. 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 reducting / stabilizing