ISSN 0974-3618 (Print)
0974-360X (Online)

www.rjptonline.org

RESEARCH ARTICLE

Study the effect of biosynthesized gold nanoparticles on the enzymatic activity of alpha-Amylase

Rusul Y. Hameed[1], Israa Nathir[2], Waleed K. Abdulsahib[3], Haider Abdulkareem Almashhadani[4]

[1]Al Hikma College University, Baghdad, Iraq.
[2]Department of Pharmacy, Al-Rasheed University College, Baghdad.Iraq.
[3]Pharmacology and Toxicology Department, College of Pharmacy, Al- Farahidi University, Baghdad, Iraq.
[4]Department of Dentistry, Al-Rasheed University College, Baghdad, Iraq.
*Corresponding Author E-mail: **H_R200690@yahoo.com**

ABSTRACT:

In this paper, investigates the biosynthesis of gold nanoparticles (AuNPs) by biochemical method using *Myrtus communis* leaves extract as reducing agent and Chloroauric acid ($HAuCl_4$) as precursors. X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM) and FTIR were used in addition to UV-visible spectroscopy (UV) in order to characterize the AuNPs. The biosynthesized AuNPs exhibited inhibitory effects on alpha amylase and alkaline phosphatase in sera of patient with type 2 Diabetes Miletus and the sera of healthy control subjects; the inhibition percentage with alpha amylase was 72 % and 45 % for patient and control group respectively. Oral consent obtained from the most of patients and healthy subjects before them being under study. Biological activities were investigated against some bacteria species to exploit AuNPs potential. Kinetic studies of alpha amylase exanimated. The goal of this study is to synthesized gold nanoparticles using simple, economical and environmentally green method. This stage is more suited to large-scale manufacturing since it is speedy and removes the complex steps in other bio-based methods.

KEYWORDS: Gold nanoparticles, *Myrtus communis* leaves extract, Biological synthesis, Alpha amylase enzyme, and biological activity.

INTRODUCTION:

The high surface area that provides distinct features and possible applications compared to their bulk counterparts has sparked a lot of scientific interest in nanoparticle creation and characterization[1-3]. Gold, gold, copper, and platinum nanoparticles created via physical, chemical, and biological methods. Due to their apparent simplicity, low cost of implementation and environmental friendliness, biological treatments is increasingly becoming a viable alternative to standard methods. Several studies have observed the development of gold nanoparticles with bacteria from biological sources[4], fungi [5]and plants[3,6,7].

Due to the extreme high rate of plant extract response and the lack of specific conditions necessary, Plant medium green chemistry has developed as one of modern nano-biotechnology research's active fields.[8, 9].

Gold nanoparticles have been employed in a wide range of applications, including electronics, biological equipment, and the production of several biological and pharmaceutical products[10]. This is most likely owing to the nanoparticles' stability, which is ideal for medicinal applications[11, 12].

Antimicrobial agents such as gold are commonly employed; gold ions can destroy a wide spectrum of microorganisms by modifying the structure and activities of the cell membrane[11,13]. Microorganisms were destroyed by nano-gold particles at very low concentrations (less than 5 μM), hence they are utilized as a germicide in purified water system[13-15].

Received on 06.04.2022 Modified on 20.05.2022
Accepted on 17.06.2022
Research J. Pharm. and Tech. 2022; 15(8):3459-3465.
DOI: 10.52711/0974-360X.2022.00579