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Antiplasmodial activity of silver nanoparticles: A novel green synthesis approach

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ABSTRACT

Objective: To synthesize silver nanoparticles using silver nitrate by a green technique which involves different compositions of aqueous leaf extracts of *Asadirachta indica* (neem) and *Ocimum sanctum* (tulsi). **Methods:** Their shape and size were determined using transmission electron microscopy and UV-visible spectroscopy. Their antiplasmodial activity was studied using the malarial parasite strain (*Plasmodium falciparum*, 3D7). The parasite strain (3D7) was collected and revived *in vitro* using Trager and Jensen method in RPMI 1640 medium for 7-8 cycles. Half maximal effective concentration values were calculated by nonlinear regression analysis. **Results:** Transmission electron microscopy results confirmed the formation of silver nanoparticles with size ranging from 4.74–39.32 nm and their size differs by varying the concentrations from 20% to 100% of neem extract in neem and tulsi extracts. It was observed that samples B and C showed half maximum effective concentration of about 0.3 μ M. **Conclusions:** It can be easily established that the aqueous leaf extracts of neem and tulsi in combination can be a good source for synthesis of silver nanoparticles with small size possessing appreciable antiplasmodial activity.

1. Introduction

Nanotechnology is a versatile branch of development and research which is growing at a tremendous rate from the past two decades. Nanoparticles are known for their numerous physical, biological,

considered to be more versatile[15,16].

The use of green techniques for synthesis of nanoparticles is a rapid, low cost and eco-friendly process. The advantage of using plant extracts for synthesis of nanoparticles is that each plant extract, by virtue of its unique metabolites such as polyphenols, terpenoids and thiols, gives rise to a wide diversity of unique