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SHORT COMMUNICATION **OPEN ACCESS**

Synthesis of Silver Nanoparticles from *Abrus precatorious*

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ABSTRACT
Abrus Precatorious is one of the significant spices usually known as Indian licorice having a place with family Fabaceae. It is accounted for to have an expansive scope of helpful impacts, similar to hostile to bacterial, against contagious, against growth, pain-relieving, calming, hostile to fitful, against diabetic, hostile to serotonergic, against headache, counting treatment of irritation, ulcers, wounds, throat scratches, and injuries. It is presently considered as an important wellspring of remarkable regular items for improvement of meds against different sicknesses and furthermore for the improvement of modern items yet at the same time, extra data should be refreshed. Subsequently, the present audit is meant to order up the refreshed information and featuring the exceptional highlights on its pharmacological exercises in different illnesses.
Keywords: *Silver nanoparticles, Abrus precatorius, Ayurveda, anti-biotic.*

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INTRODUCTION

The use of biological principles and materials to construct novel technologies and systems integrated from the nanoscale [1]. The nanoscale concept and techniques to study and modify biosystems (living and non-living). The subcellular level, and in seeing the cell as a highly ordered, self-repairing, self-replicating, information-rich molecular machine [2]. Wet and dry nanotechnology are two types of nanotechnologies, with the first describing live biosystems and the second dealing with man-made items at nano-scale structures [3]**.** Silver nanoparticles have also been utilized to determine CT-DNA and as possible biological markers [4]. Restorative plants, spices, flavors, and natural cures are known to Ayurveda in India since significant time frames. The worth of restorative plants, spices, and flavors as natural cures is being lost because of absence of mindfulness, and deforestation. The outcome is numerous significant restorative spices are becoming uncommon and valuable data is lost. The current acknowledged present-day medication or allopathic has continuously evolved throughout the years by logical and observational endeavors of researchers. Be that as it may, again in most recent couple of many years a portion of the nations are attempting to come in the field of natural medication for their development and advancement. Gradually it is getting promoted in creating and created nations inferable from its regular beginning and lesser aftereffects [5].

India is one of the biggest makers of restorative spices and is appropriately called the greenhouse of the world as it is perched on a gold mine of very much recorded and customarily all-around rehearsed information on home grown medication. [6]. In such manner India has a remarkable situation on the planet, where various perceived native frameworks of medication are accessible for the medical care of individuals. No questions that the natural drugs are famous among provincial and metropolitan local area of India. The requests for plant-based medications are expanding extremely quickly in India. From this, we can say that search is continuing for additional plants which can give remedial action in treatment of different infections. Among the customary arrangement of medication, *Abrus precatorius* Linn is one of the significant spices generally known as Indian licorice having a place with family Fabaceae. Anand et al 2010 revealed the data [7] on this plant as a survey however article should be refreshed with extra data (plant species and pharmacological exercises). So, our point is to add the need of data with revealed information and we are attempting to join the most recent data with more seasoned information which isn't accounted for till now for advantage of public premium to carry out in day-to-day existence to give

another shape. As a result, the text in this audit teaches us about numerous species all over the world, unique common names in India, and pharmaceutical applications.

MATERIAL AND METHODS

Preparation of plant extract

Abrus precatorius leaves were washed three times with distill water and dried for five days. Using a mortar and pestle, the powder was extracted from the dry leaves. The leaf powdered was sterilized for 15 minutes at 121°C. 20 g powder was added to 200 ml distil water and maintained in a 60°C boiling for 10 minutes. Watman filter paper No.1 was used to filter the extracts. For subsequent research, the purified extract was preserve in the refrigerator at 4°C for further study.

Isolation of Silver nanoparticle

A solution of 1 mM AgNO3 was made and kept in an amber-colored container. A 1mM AgNO3 solution was added to the leaf extract. The silver nano-particles were generated from the leaves for characterization and antibacterial activity, as shown by the solution's colour shift from yellow to brown.

Antibacterial activity

Bacillus subtilis, *Staphylococcus aureus*, and *Pseudomonas* were the microbes employed in this investigation the normal procedure was followed for performing the disc diffusion experiment. Bacterial cultures (100 ml) were distributed overnight using a sterilized glass L-rod onto luria burtini Agar plates. Each filter paper disc (5 ml media), received 100 ml of each extract and was allowed to dry before being put on the agar. Each extract was tested, and the plates were inoculated at 37C for 24 hours after incubation.

UV–Vis spectra analysis

At 5 hours after diluting, the UV-Vis spectrum of the medium was measured to track the reduction of pure silver ions. The UV– Vis spectrophotometer UV-550 was used to perform a small aliquot analysis.

RESULT AND DISCUSSION

Silver nanoparticle

When the extract was exposed to $AgNO_3$, the biosynthesis process began in a matter of minute, and the colour response was noticed, in which the clear $AgNO_3$ became brown (figure. 2), indicating the creation of matching nanoparticles. Silver nanoparticles produced by *Abrus precatorious* have UV–Vis spectra. Surface plasmon resonance of silver nanoparticles, which has a characteristic peak at 405 nm (Figure.3).

The appearance of a low-intensity peak at 439nm corresponds to the absorption intensity gradually increasing as a function of time reaction with no shift in peak position. According to studies of silver nanoparticle production and biological properties. The peak at 440 nm is caused by longitudinal plasmon vibrations being excited [8]. The bigger particle sizes achieved by the sluggish diffusion of the glucose as a reducing agent within the agarose matrix, relative to sodium borohydride, are connected with the shift in the plasmon band for higher wavelength [9].

Antibiotic activity

Antibacterial activity of synthesised nanoparticles Silver nanoparticles have a better antibacterial effect against *Bacillus subtilis and Pseudomonas* than against *Staphylococcus aureus* because Gram-positive and Gram-negative bacteria have different cell wall compositions. The presence of silver nanoparticle solution and antibiotic disc, the inhibition zone surrounding each well is shown in(figure.4). The silver nanoparticles synthesized by *Abrus precatorios* extract were found to have highest antibacterial activity against *pseudomonas spp* which reveals that the silver nanoparticles isolated from *Abrus precatorios* leafes may be used to treat the diseases caused by pseudomonas (figure.4-C). The antibacterial activity was observed against *Staphylococcus aureus and Basillus subtilis* which expressed that the silver nanoparticles of *Abrus precatorius* plant can kill these pathogen till some extent (figure.4- A,B).

According to Shahverdi et al., silver nanoparticles show antibacterial properties against *Bacillus subtilis, Staphylococcus aureus, and Pseudomonas aeruginosa.* Antibacterial properties are provided by [10]. oligodynamic action on microorganisms. Smaller particles' chemical reactivity is increased as the local electronic structure on their surfaces changes, resulting in a bactericidal effect. [11].

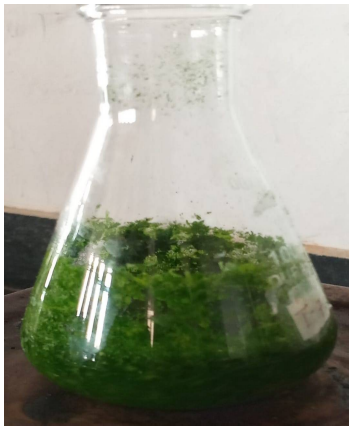


Fig.1 Preparation of leaf extract

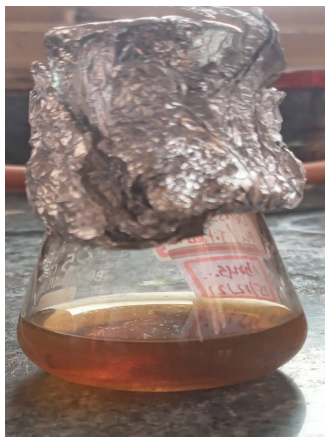


Fig.2 AgNPs formation from the leaf extract

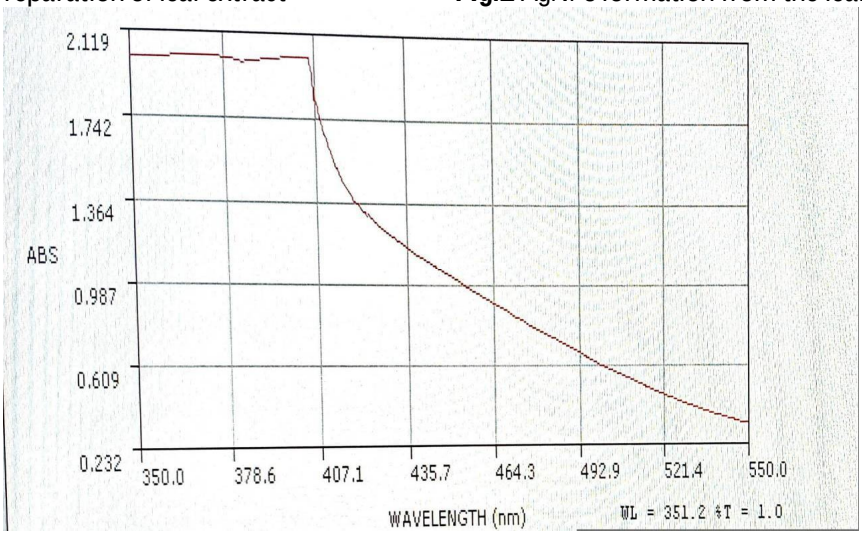
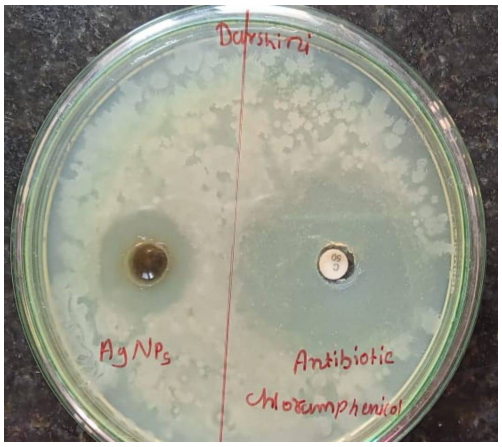
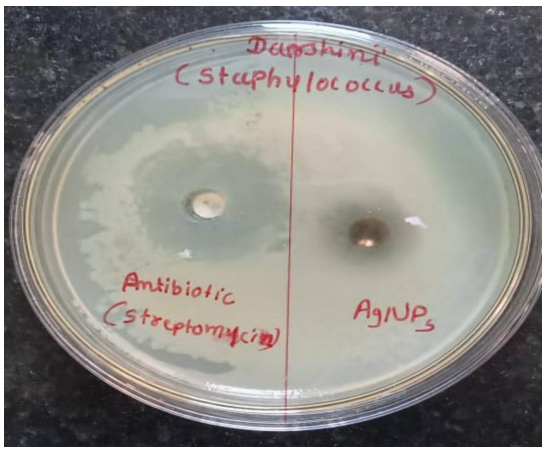


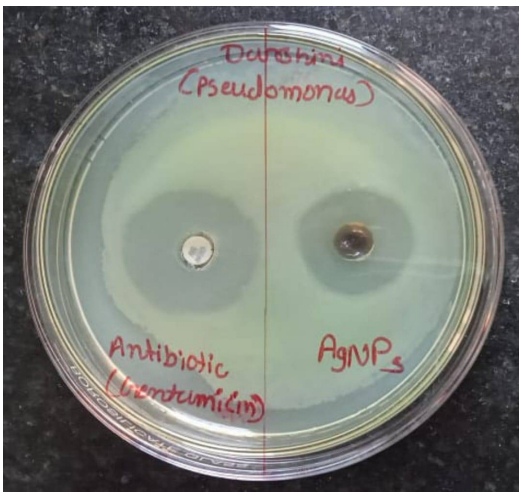
Figure.3 UV-Vis spectra



A. *Bacillus subtilis*



B. *Staphylococcus spp.*



C. *Pseudomonas spp.* **Figure.4** Result of antimicrobial activity

CONCLUSION

Using *abrus precatorious* leaf extract, we were able to reduce silver physiologically. Silver nanoparticles were created in natural conditions, and UV-Vis spectroscopy was employed to characterise them. Silver ions were converted to metallic nanoparticles by phytochemicals identified in the extract of *Abrus precatorious*. This could be the first time a leaf has been sterilised before being extracted with the goal of removing surface microorganisms. The produced silver had antibacterial efficacy against *Bacillus subtilis, Staphylococcus aureus,* and *Pseudomonas aeruginosa.* The method for mass-producing nanoparticles from readily available plant extracts could be financially viable, and it could be utilized to advance biology and materials science research. By developing Nanomedicine against a variety of human and veterinary infections utilizing such plant extracts.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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