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SYNTHESIS AND CHARACTERIZATION OF ZINC NANOPARTICAL FROM LUFFA ACUTANGULA

Chemistry

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ABSTRACT

Luffa acutangula frequently called wipe gourds. Plant belongs to the curcubitaceae family. The fruits, which also have a network of fibres neighboring a large number of flat blackish seeds. It is reported to have oriented from India. *Luffa acutangula* has been reported to posses both medicinal and nutritional properties. Its seeds have been used in the treatment of asthma, sinusitis and fever. We discussed on the Synthesis and characterization of zinc Nanoparticles by green synthesis method. It attempt was made to zinc Nanoparticles is prepared by using a medicinally plant *Luffa acutangula.* Zinc acetate as used to synthesis the zinc Nanoparticles by using leaf extract of *Luffa acutangula.* The optical characterization was carried out using UV – Visible and FT – IR analysis.

KEYWORDS

INTRODUCTION

In India large quantities of medicinal plants are extracted from wild to meet the increasing demand for raw material for domestic consumption and export. Food demands have been accelerated with the exponential human population growth resulting in marginal land resource availability for growing the food crops. Medicinal plants have also be found useful in the treatment of infections caused by fungi, bacteria, viruses, parasites and certain clinical conditions occurring naturally or resulting from exposure to environmental contaminants *Luffa acutangula* contains insulin like peptides that lowers and balances blood sugar. *Luffa acutangula* also contains Vitamin C for keeping away colds, zinc for strengthening our immune system, iron for anemia, plus calcium and phosphorus for strong bones. Ridge Gourd is a very healthy veggie because it contains very few calories and thus it works well for weight loss. The Luffa acutangula Linn. Var. amara Roxb. is a fairly large climber found in western, central and southern India, and regarded as wild variety of cultivated species. It is resembles to Luffa acutangula in every aspects, except the leaves, flower, fruits amd seeds are smaller. It is commonly in Marathi as Kadudodak, Ranturai, in Sanskrit Katukoshataki, while in Hindi karviturai. All parts of plant are exceedingly bitter. A crystalline bitter principle identical with cucurbitacin B, luffin, and colocynthin is present.1 While seeds shows presence of saturated and unsaturated fatty acid palmatic, stearic, oleic, linoleic and traces of lignoceric acid. The plant possesses laxative and purgative property. Nanotechnology research has gained momentum in the recent years by providing innovative solutions in the field of biomedical, materials science, optics and electronics. Nanoparticles are essentially a varied form of basic elements derived by altering their atomic and molecular properties of elements. The Luffa acutangula are useful in opthalamia, inflammations, catarrh, diabetic and asthmatic complaints. The leaves are used for the heart and brain disorders. The Luffa acutangula valuable in the treatment of conjunctivitis, leucorrhoea and deafness. Fruits give feeling of freshness and energy. It is used as carminative and astringent Zinc oxide is an inorganic compound with the molecular formula ZnO. It appears as a white powder and is nearly insoluble in water. The powder ZnO is widely used as an additive in numerous materials and products including ceramics, glass, cement, rubber (e.g., car tyres), lubricants, paints, ointments, adhesives, plastics, sealants, pigments, foods (source of Zn nutrient), batteries, ferrites, and fire retardants. In this work we have used environmentally benign the extracts of Luffa acutangula which have exceptional therapeutic properties. The structural, optical, properties of the ZnO NPs have been evaluated.

MATERIALS AND METHODS

Zinc acetate dihydrate (Merck), sodium hydroxide pellets (Merck.), distilled water were used in the nanoparticle synthesis with the extracts. Luffa acutangula were collected from the Botanical garden.

Preparation of leaf extracts

Luffa acutangula (50 g) were thoroughly washed, dried and then boiled in 50 ml of deionised water for half an hour.The resulting extract was cooled and used as the extract solutions.

Synthesis of ZnO nanoparticles

Ridge gourd [60g] were throughly washed in the distilled water and grained then boiled in 50ml of distilled water for half an hour. The *resulting extract* was cooled and used as the extract solutions.In this method, 0.25 g of zinc acetate was dissolved in 50 ml water. 4 ml of the extract of Luffa acutangula was added dropwise and the resulting mixture was stirred for 10 minutes using a magnetic stirrer. In order to adjust the pH of the solution to pH 12, NaOH (2 M) was added drop-wise while stirring. A white crystalline precipitate of zinc oxide was obtained, which is washed repeatedly with water, filtered and dried in an oven at 60°C to obtain the ZnOnanoparticles

RESULTS AND DISCUSSION

Zinc nano particles have used in the food industry, paint industry, ceramic industry Figure.1. shows the FTIR spectrum of the ZnO nanoparticles synthesized fromsolgel method,which was aquired in the range of 400-4000 cm-1 .The band between the 450-500 cm-1 corelated to metal oxide bond (ZnO). The peaks in the range of 1400-1500cm-1 corresponds to the C=O bonds. The adsorbed band at 1582 cm-1 is assigned O-H bending vibrations. The peak at 1342cm-[1] corresponds to C=O and The FTIR spectrum of zinc nanoparticles in case both of Luffa acutangula ratios showed the band between 3440-3500 cm-1 corresponds to O-H stretching

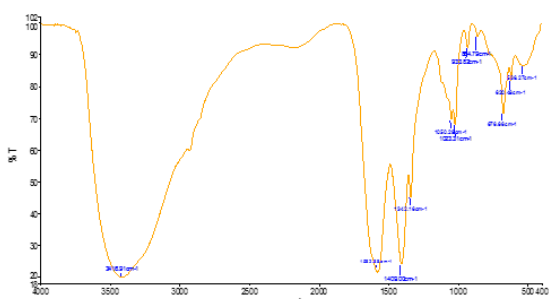

Fig: 1 FTIR Spectrum of Zinc nanoparticle

The UV-Vis spectrum of colloidal solutions of Zinc nano particle synthesized from leaf of Luffa acutangula have the characteristic absorbance peaks at 320nm (Fig-2); and the broadening of peak indicated that the particles are poly-dispersed

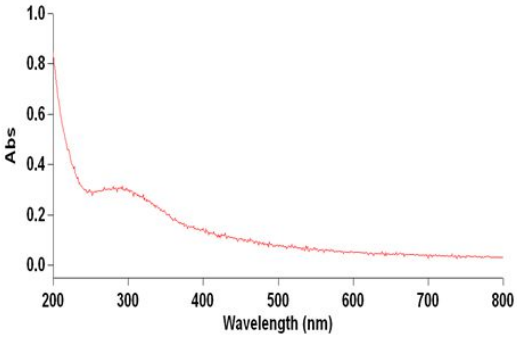

Fig.2 UV Spectrum of zinc nanoparticle

CONCLUSION

Zinc nano particle was synthesized by the green synthesis method using Luffa acutangula is simple and cost effective. The as Zinc nano particle were characterized using several techniques such as, FTIR and UV –Vis The blue shifted UV-Vis absorption peak at 320 nm confirmed the presence of ZnO in the nano scale.

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