

SYNTHESIS AND CHARACTERIZATION OF ZIRCONIA NANOPARTICLE AND ITS ANTI-MICROBIAL ACTIVITY AGAINST- *Candida albicans*

SRI JANANI.J (UR11BT115)

GUIDE: Ms.K Shanti naidu, Karunya University

Abstract: Nanotechnology is the manipulation of any matter on atomic, molecular and supramolecular scale. The synthesis of ZrO_2 nanoparticle was done with *Curcuma longa* as the precursor. The characterization was been done by UV-Vis, SEM and XRD. The different concentrations of ZrO_2 nanoparticle showed better results on the oral pathogen during antimicrobial activity.

Introduction: The prefix “nano” refers to the nanometer (nm), one billionth of a meter. In recent years, researchers have become increasingly adapt at manipulating the shape and size of materials at the nanometer scale and have therefore been able to study and exploit these unusual properties.

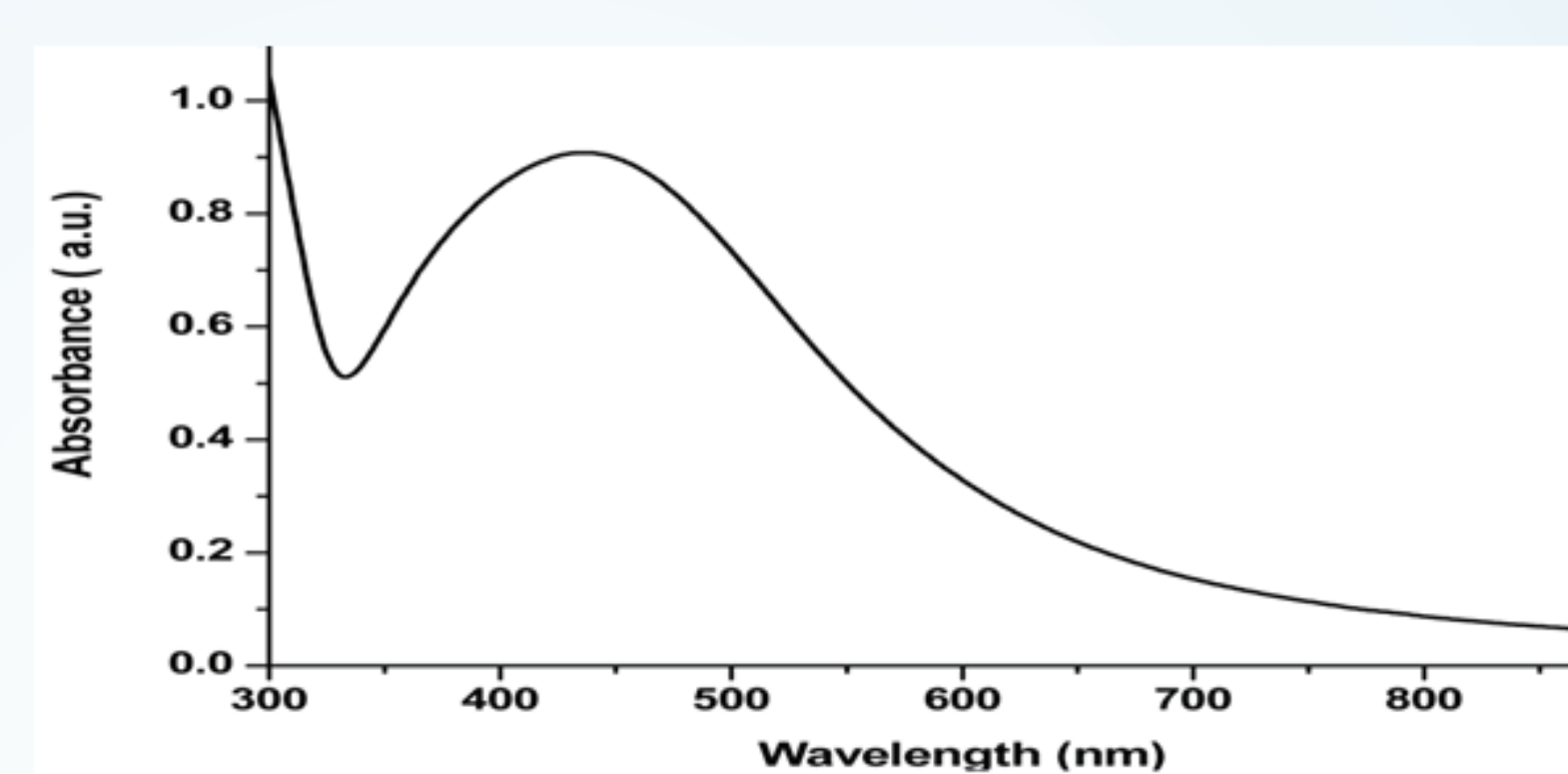
Aim and Objective: To perform the anti-microbial activity against *Candida albicans* using green synthesized ZrO_2 nanoparticle.

Methodology: Green synthesis has been performed with ZrO_2 a precursor and *Curcuma longa* as the reducing agent. The results has been obtained by SEM(Scanning Electron Microscope), XRD(X-Ray Diffraction) and UV-Vis Spectrophotometer. Anti-Microbial activity was done using *Candida albicans* by agar diffusion test. The highest concentration was found to be 24mm in 16 μ g.

RESULTS:

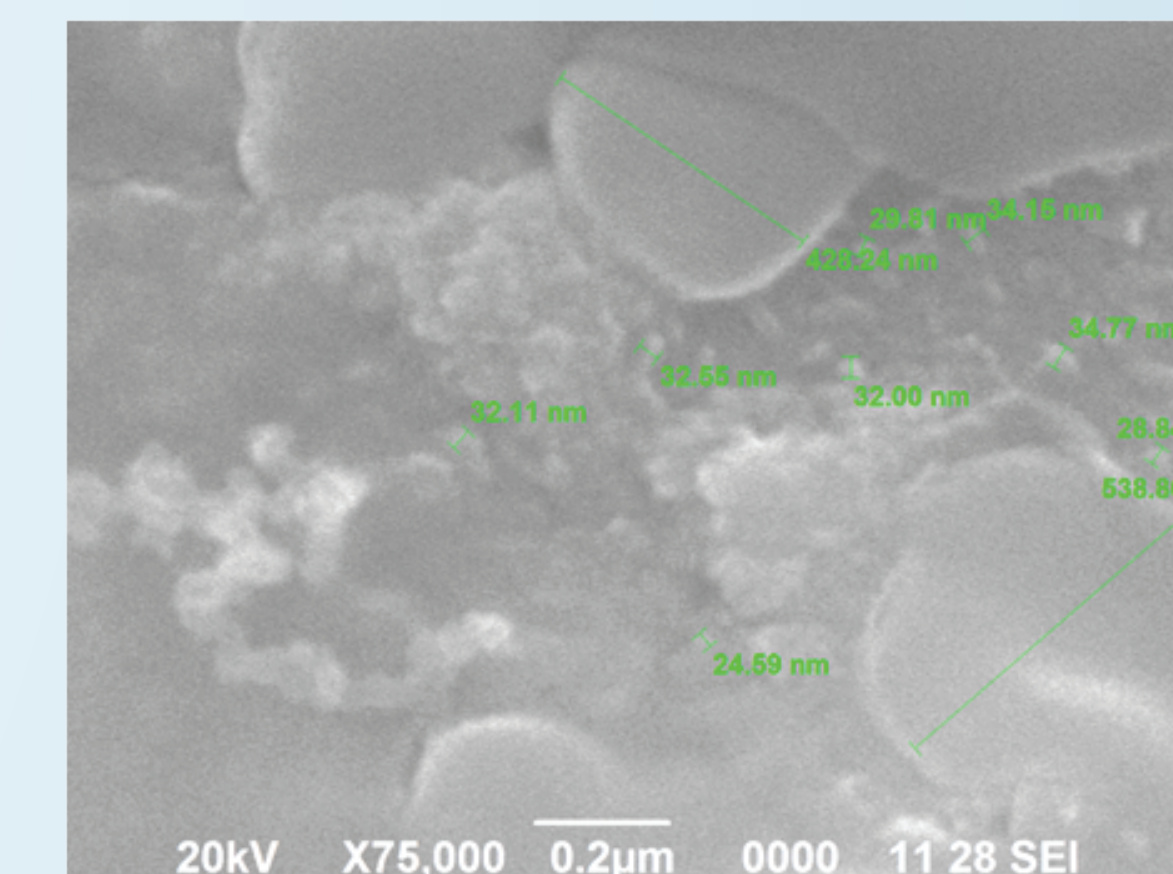
UV-Vis Spectrophotometer:

The UV-Vis peak was observed to be 400-420nm



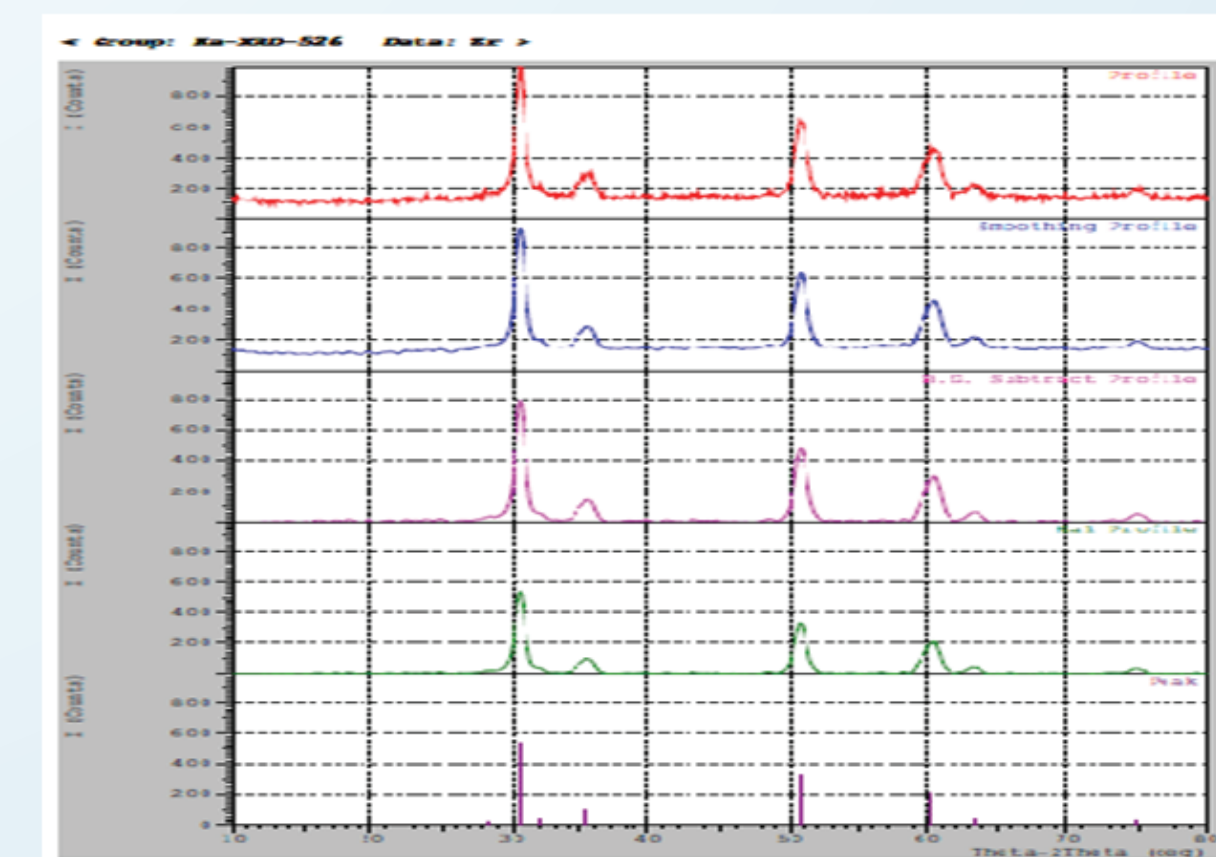
SEM (SCANNING ELECTRON MICROSCOPE):

SEM showed particle size as 0.2 micrometer at 75,000x magnification.



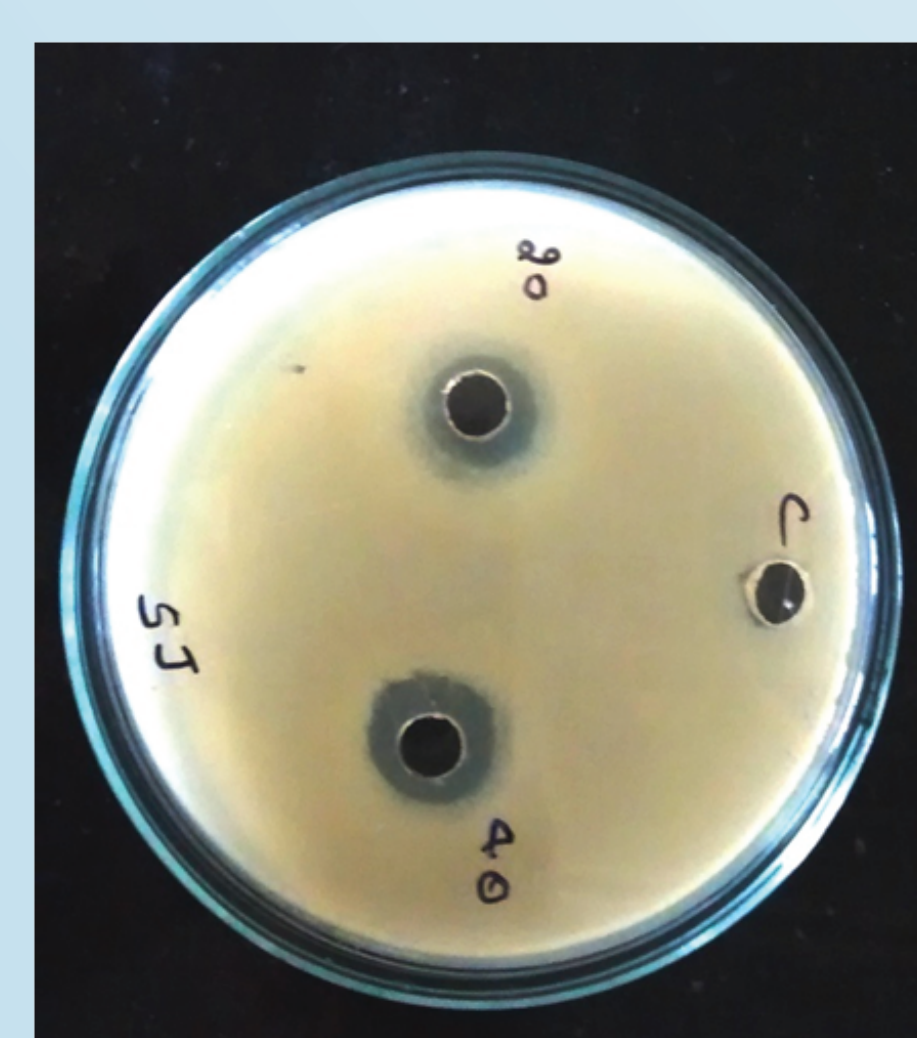
XRD (X-RAY DIFFRACTION):

XRD results showed 100% intensity at 2θ value with 40° which gives a crystalline structure.

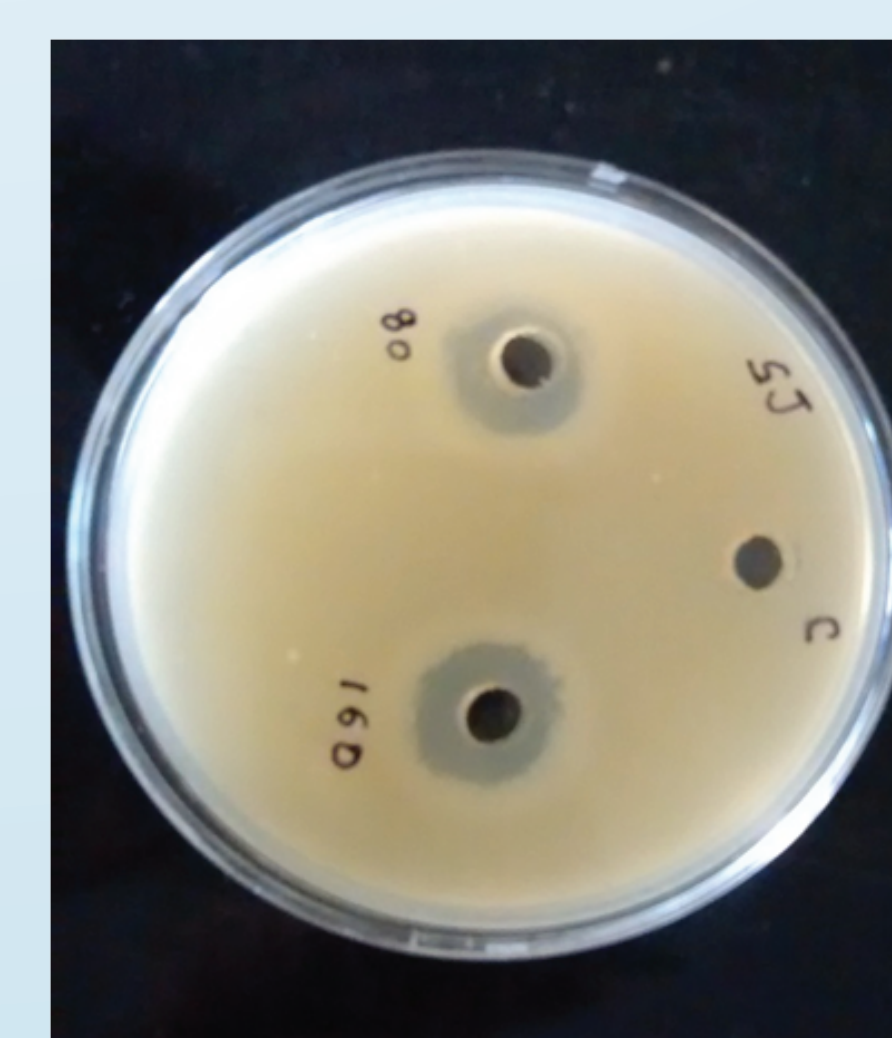


ANTI-MICROBIAL ACTIVITY:

Zone of inhibition was done at different hours at different concentrations.



Zr (microgram)	Zone of inhibition (mm)
20 μ g	18mm
40 μ g	20mm



Zr (microgram)	Zone of inhibition (mm)
80 μ g	23mm
160 μ g	24mm

Conclusion: Zirconyl dioxide is the best effective material that can be used against oral thrush. Side effects of antibiotic can be reduced by using ZrO_2 Nanoparticle since they are giving better results. In future, research can be done to improve the effect of ZrO_2 on oral thrush. The size of the ZrO_2 Nanoparticle can be reduced further to give better results.