

# Antifungal activity of Nanoparticles of Zinc, Copper, Cerium oxide, Silver, Gold, and Selenium against clinical isolates of *Aspergillus*

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**Introduction:** One of the critical causes of morbidity and mortality in healthy and immunocompromised patients is Aspergillosis.

Regarding to Aspergillosis has a weak prognosis, it would easily disseminated. Studies on species of *Aspergillus* proved that *Aspergillus fumigatus* is the main agent among others, and it will be followed by *Aspergillus flavus*, *Aspergillus niger*, *Aspergillus terreus*, and *Aspergillus nidulans*. Nowadays, the antifungal resistance considered to be elevated. This study is aimed to evaluate the efficacy of Nanoparticles of Zinc, Copper, Cerium oxide, Silver, Gold, and Selenium against *Aspergillus* species.

**Results:** Based on the results, Nanoparticles of zinc, silver, gold, and selenium showed a significant inhibitory effect on *Aspergillus* species. On the other side, copper and cerium oxide didn't show inhibitory effect.

**Material and Method:** The antifungal activity of zinc, copper, cerium oxide, silver, gold, and selenium nanoparticles were evaluated against a total of 11 clinical *Aspergillus* isolates based on the M38-A2 guideline. As it shows in the chart they includes *A. fumigatus* (27%), *A. flavus* (36%), and *A. welwitschiae* (36%).

<i>Aspergillus</i> species	No.	Antifungal compounds	MIC (µg/ml) respectively	-	+
<i>A. fumigatus</i>	3	zinc, silver, gold, and selenium	128-512, 26-53, 21-85, 6-26	-	G
<i>A. flavus</i>	4	silver and selenium	26-53 and 106-425	-	G
<i>A. welwitschiae</i>	4	zinc, silver, gold, and selenium	512, 26-53, 85, 1-13	-	G
<i>Aspergillus</i> isolates	11 (100%)				

**Discussion & Conclusion:** Over the last decade, assessing the clinical efficacy of antifungal agents with plants origin on preventing and treating the infections is becoming a new approach to the research society. However, the nanoparticles of zinc, silver, gold, and selenium were effective against *Aspergillus* species, yet the MIC range wasn't that significant. So, it is recommended for future studies to investigate more.

