Use of plant pathogenic fungi *Fusarium moniliforme* for biosynthesis of silver nano particles with emphasis to time

S. J. Ashrafi [1*] ,M. F. Rastegar [1], B. jafarpour [1], S. A. Kumar [2]

[1]-*Plant protection, Ferdowsi university of Mashhad, Mashhad, Iran.,* jamal.ashrafi@stu-mail.um.ac.ir

[2]- *Biomedical Engineering, McGill University, Montreal, Canada*

INTRODUCTION: One approach that shows immense potential is based on the biosynthesis of nanoparticles using biological micro-organisms such as fungi. While a number of chemical methods are available and are extensively used, they are often energy intensive, employ toxic chemicals, and require higher temperatures. At There Synthesis of silver nanoparticles using plant pathogenic fungus Fusarium moniliforme demonstrated.

METHODS: Fungi extract prepare with culturing a 5mm disc of fungus at PGB (juice of 200 g boiled potato, 15 g glucose /1 liter sterile water) media in vial glass at 21-27 ºC with shaking (180 rpm) for 4 weeks. After the incubation, the biomass was filtered (Whatman filter paper No. 1). AgNO3 (1 mM of final concentration) was mixed with cell-free filtrate in a 100 ml glass vial and agitated at 28□C. Control ((without silver ions) was also run along with the experimental glass vial. The absorbance was measured at the resolution of 1 nm using a UV-visible spectrophotometer (Uv/vis 2100-PC, Japan). Energy-dispersive X-ray spectroscopy was done (Leo 1450VP, Germany). Stub covered with aluminum foil and one drop of Samples were poured on it, allowed to dry in room temperature and coated with very thin layer of gold.

RESULTS: Upon addition of Ag+ ions into the filtered cell-free culture, samples Changed in color from almost colorless to brown, with intensity increasing during the period of incubation (Fig 1b). Control (without silver ions) showed no change in color of the cell filtrates when incubated in the same conditions(not shown). Formation of colloidal silver particles can be easily followed by changes of UV-Vis absorption, that at here we showed this variation during the synthesis and 7 month after it (Fig.1).

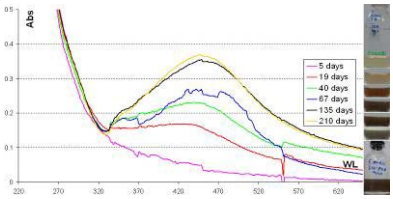

Fig.1: UV–Visible absorption spectra of silver nanoparticles during 7month of reaction (first 5 days reaction was don at 28C and 180 rpm). b: color changes during these times.

In EDS analysis shows the peak in silver region confirming presence of elemental silver (Fig 2)

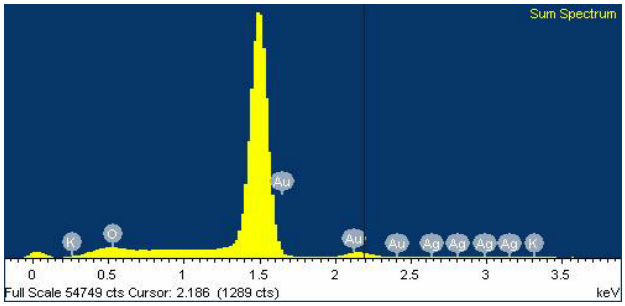

Fig 2: DifferentX-ray emission peaks showing Signals from the atoms in the silver nanoparticles are observed, whereas strong signals from Au atoms are also visible (related to used coat).

DISCUSSION: We demonstrated simple, stable and efficient biological method for synthesis of silver nanoparticles using fungus, F. moniliforme. The synthesis nano particle monitoring with use of Uv/vis spectrophotometer methods for measurement the stability and changes of this particle during the time. importance result of our work is, for investigate the potential of an fungus in biological synthesis some time need more than five days, with attention to papers we could observe that they note to first five days after incubation. Or other fungi at first days showed good result but after some weeks quickly aggregate and precipitate in media (not reported our data). However the fungal biosynthesis is dynamic and during the time will be result to better or worst, particularly in light vessels. Duran and co-workers.[1]reported in same study F. oxysporum could synthesis silver nano particle but F. moniliform could not synthesis it. Although we use three forme special of F. oxyspourum with F.moniliforme at this study and observed all of them could synthesisi with some variation in speed of synthesis, size and shape of nano particles. (Did not show).

REFERENCES:N. Duran, P.D Marcato, et al (2005). Mechanistic aspects of biosynthesis of silver nanoparticles by several Fusarium oxysporum strains. *J nano bio* **3**:8.