

# INCREASE PRODUCTION OF PRODIGIOSIN PIGMENT FROM MUTANT *SERRATIA MARSCENCES* AGAINST BACTERIAL MALIGNANT TUMORS (CANCERS) BY PHYSICAL MUTAGENESIS

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**ABSTRACT :** The goal of study in order that increase expression of prodigiosin pigment from mutant *Serratiamarscences* with study the effect antimicrobial activity of prodigiosin pigment against bacterial isolated from malignant tumors patients. The isolates collected 125 isolates from Baghdad hospitals linked with Leukemia, Belly cancer, Cochlea cancer, Spleen cancer, Renal cancer and liver cancer. Outcome of isolation were 20 isolates (17%) *Staphylococcus aureus*; 18 (14%) *Escherichia coli*; 9 (7%) *Acinetobacter baumannii*; 9 (7%) *Salmonella* spp.; 9 (7%) *Streptococcus* sp.; 5 (4%) of *Klebsiella pneumonia*; 5 (4%) of *Pseudomonas aeruginosa*; 5 (4%) *Pantoea* spp.; 5 (4%) *Aeromonas* spp.; 5 (4%) *Morganella morganii*; 5 (4%) *Staphylococcus epidermidis* and 5 (4%) *Micrococcus* sp., also collecting *Serratia marscences* 25 (20%) from total 125 isolates from different infections of patients.

The physical mutagenesis achieved by Nd:YAG lasers in 500 pulse, the results of mutagenesis exhibit high expression of prodigiosin after physical mutagenesis to isolates of *S.marscences* which was 15 isolates (60%) and compared prodigiosin production before the mutagenesis which was 25 isolates (total isolates of *S. marscences*); the bacteria were also exposed to Alpha, Gamma and Beta rays to different radio sources (isotopes) including Am<sup>241</sup> (1Mci) emitted Gamma and Alpha ray with dose 0.31993\*10<sup>-4</sup>KGy for Gamma ray and 1.4157 KGy at 3 hr. for Alpha particles.; Sr<sup>90</sup> (9 Mci) emitted Beta ray in dose 1.973\*10<sup>-8</sup>KGy at 3 hr.; Cs<sup>137</sup> (1Mci) emitted Beta and Gamma ray in dose 1.3158\*10<sup>-8</sup>KGy at 2 hr. for Beta ray and 1.973\*10<sup>-10</sup>KGy at 3 hr. for Gamma ray; Na<sup>22</sup> (1Mci) emitte Beta and Gamma ray in dose 1.533\*10<sup>-8</sup>KGy at 3hr. The results of exposure showed high improvement production of prodigiosin in Americium were 21 isolates (84%), Strontium 17 (68%), Cesium 23 (92%) and Sodium 12 (48%) that give high expression of prodigiosin pigment. The prodigiosin dye was taken away of *S.marscences* via Chloroform in acid-base medium method and purification by TLC (Thin Layer Chromatography mechanization) by employ Silica gel sheet. The antibacterial effect of prodigiosin pigment from mutant *S. marscences* was done before the mutagenesis and after the mutagenesis in order that comparison between them by utilizing well diffusion method, the results of antimicrobial activity of prodigiosin against bacterial tumors exhibit possession effectiveness on all isolates (100 isolates) but differ in the effect of diameter of inhibition zone around well, almost possess high inhibition zone area another possession intermediate inhibition zone and others possession small inhibition zone; all the antimicrobial activity test grant positive results for killing bacterial malignant tumors (cancers).

**Key words :** Mutagen, tumors, radiation, mutant, lasers, Radio sources.

## INTRODUCTION

*Serratia* spp. is a rod-form, Gram negative, aerobic or anaerobic in some situation (Bayona *et al*, 2009). It is motile, non-spore forming, opportunistic pathogen (Perez *et al*, 2011) causes diverse ailment inclusive Pneumonia, wound infection, Meningitis, Septicemia and infections from respiratory, urinary duct and endocarditis (Casolari *et al*, 2005; Matsuo *et al*, 2008).

Prodigiosin is a red pigment secondary metabolic product restricted to the plasma membrane of

microorganisms, created during stationary phase (Wang *et al*, 2004; Fineran *et al*, 2005). It's not able to intermingle by diffusion in the environment, not resolve in water, but dissolve in alcohol agent and comparatively of organic solvent inclusive bromoform, chloroform, acetone, benzene, Di methyl sulfoxide (DMSO) (Khanafari *et al*, 2006).

Nd:YAG lasers is (Neodymium-doped Yttrium aluminum Garnet), which supply the lasing efficiency in the crystal. Nd:YAG lasers issue light with