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THE EFFECT OF UV/FREE RADICAL'S TREATMENT ON ANTIBIOTIC RESISTANT BACTERIA: REVIEW

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Abstract

Since human ingesting for antibiotics has been elevated, the distribution of antibiotic resistant bacteria has been elevated after then. The MRSA infections as an example is regarded as very dangerous infections comparing with other antibiotic resistant bacteria, the percentage of people lost their lives because of MRSA infections were around 11,285 in United States [1]. The antibiotic resistant bacteria have turn out to be a problem threatening human health in general and considered as the main cause of the genes of antibiotic resistant expansion as these bacteria can transport their resistance genes to other sensitive bacteria in a horizontal way [2].Given to this situation, the diffusion of antibiotic resistant bacteria will be increased the existence of resistant genes in different habitat. This review will show the role of different human actions that lead to increase the growth of antibiotic resistant bacteria in the environment and their genes and will highlight the suitable solution to decrease the number of antibiotic resistant bacteria in water treatment plants. This review will discuss the effect of uv/free radicals in stopping the spread of these bacteria in environment [3].

Introduction

Due to the different human actions affecting the environment negatively, antibiotic resistant bacteria are available in many aquatic habitats such as natural water environment, different wastewaters and mud overflow. This is due to the different medical sectors, industrial and animal wastes that have been washed off to the water

environment, these wastes are filled with dangerous materials heavy metals, different drugs and harmful microorganisms as an example [4].

Wastewaters of different medical sectors might increase the presence of antibiotic resistant bacteria by inserting a kind of selective pressure that increases the percentage of antibiotic resistant bacteria at the end and lead to prevent the growth of other kind bacteria [5].Similarly [6]. shows that selective pressure that have been done by the antibiotics affecting the number of antibiotic resistant bacteria and rise the availability of antibiotic resistant genes by inserting the mutation of different genes, transmit these mutant genes in a horizontal way between antibiotic resistant bacteria.

The highly effective role of uv light in abolishing antibiotic resistant bacteria in wastewater treatment plants is will be discussed in this review. Mixing of uv light and hydrogen peroxide will release of free radicals (OH) as a notable byproduct. OH free radical in return will affect the antibiotic resistant bacteria in a negative way by the process of oxidation [7].

uv treatment has been considered as an effective one over any other treatments and that is mainly attributed to the ability of this treatment to remove impurities such as antibiotic-resistant bacteria and their genes. Uv treatment produce OH, which in return eradicate high numbers of resistant bacteria and their genes due to oxidation process. UV light usually inactivates a large percentage of antibiotic resistant bacteria directly by damaging bacterial DNA [8].

For that reason UV/free radicals are considered as an effective way to remove 100% of antibiotic resistant bacteria in less than two hours comparing with 34% only was done via UV light unaccompanied with free radicals [9].The high activity in eradicating great numbers of antibiotic resistant genes was effectively done by UV,free radical and may be reached to 50.42 % comparing with 42.40% and 35.57 were done by UV light and free radical unaided with uv light, respectively [9].

Conclusion

Given to all these evidences, antibiotic resistant bacteria are now considered as one of the major problems that affect human health and their natural habitat and that's mainly connected to negative role of human actions and their dangerous effect on the natural habitat and human wellbeing in general [10].

The hazardous human activity of throwing away untreated wastes from different resources like medical sectors and animal farms is mainly linking to transmit antibiotic resistant genes between different bacteria and that could end up finally in appearing new types of antibiotic resistant bacteria [11].UV Light accompanied with

free radicals treatment is effectively removed the majority of the antibiotics resistant bacteria and their genes with less time is required to achieve the process [12].
Uv light usually killed the antibiotic resistant bacteria through the oxidation process. On the contrary, UV/free radical leaves several bacteria active after the treatment is successfully done and that's directly attributed may be to the nature of bacterial cells. Comparing to other treatments UV/free radicals seems to be safe to apply in the plants of water treatment.

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