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Spirulina as novel photosynthetic micro-algae for promising insulin-like protein other than pancreas

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The improvement on insulin therapy since it was first administered in early of 20th century is still hunting for better option to cure the diabetes. But insulin therapy to the patients for long periods resulted in immunological complications due to the development of insulin antibodies that cause insulin allergy and many chronic disorders. The adverse effects and higher cost of insulin had compelled scientists all over world to look for plant based insulin. Since its discovery, a formidable amount of research, strongly suggest that plants produce a protein with most of the characteristics of vertebrate insulins and plays similar roles in plants as it does in animals. There is growing interest throughout the world in Spirulina as a potential source of nutraceutical compounds, which have applications in health food, feeds, therapeutics and diagnostics. In this study, we screened different strains of Spirulina for the presence of insulin, surprisingly, most out of them showed presence of insulin-like protein. Electrophoretic mobility analysis, antigenicity test and RP-HPLC showed similar characteristic as that of bovine insulin. Secondary structure analysis of insulin-like protein by circular dichroism was also done and showed almost same α helical content. Besides this, the molecular dynamics simulations studies of insulin also suggesting an interesting result. It has two constant values at different time scales. The relative folding energy of insulin like protein from plant source suggested that it has maximum stability at neutral pH, i.e., similar to pH of human blood.

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Suitability of electrolyzed oxidizing water for the disinfection of hard surfaces and equipment in radiology

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Background: Hospitals are faced with increasingly resistant strains of micro-organisms. When it comes to disinfection, individual parts of electronic equipment of angiology diagnostics such as patient couches of computer tomography (CT) and magnetic resonance imaging (MRI) scanners prove to be very hard to disinfect. Disinfectants of choice are therefore expected to possess properties such as rapid, residue-free action without any damaging effect on the sensitive electronic equipment. This paper discusses the use of the neutral electrolyzed oxidizing water (EOW) as a biocide for the disinfection of diagnostic rooms and equipment.

Methods: The CT and MRI rooms were aerosolized with EOW using aerosolization device. The presence of micro-organisms before and after the aerosolization was recorded with the help of sedimentation and cyclone air sampling. Total body count (TBC) was evaluated in absolute and log values.

Results: The number of micro-organisms in hospital rooms was low as expected. Nevertheless, a possible TBC reduction between 78.99-92.50% or 50.50-70.60% in log values was recorded.

Conclusions: The research has shown that the use of EOW for the air and hard surface disinfection can considerably reduce the presence of micro-organisms and consequently the possibility of hospital infections. It has also demonstrated that the sedimentation procedure is insufficient for the TBC determination. The use of Biocide aerosolization proved to be efficient and safe in all applied ways. Also, no eventual damage to exposed devices or staff was recorded.

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