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Nanoflower amplified immunosensor for rapid detection of *Salmonella* Enteritidis from milk and cheese using smart phone

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Salmonella is a standout amongst the most foodborne pathogens causing harmful disease. To protect consumers from food poisoning due to *Salmonella* infection, it is important to develop a quick, simple, reliable and sensitive method which can detect *Salmonella* in foods at low concentration in a timely manner. We have effectively established a novel magnetic nano biosensor with high sensitivity for the visual and quantitative detection of *S. Enteritidis* from milk, cheese and water. Milk, cheese and water samples inoculated with different concentrations of *S. Enteritidis* have been tested using anti *S. Enteritidis* streptavidin magnetic beads and biotin labeled antibody as capture platform and coupled with nanocomposite (detecting antibody-HRP enzyme and inorganic nanoflower), where the signal amplification based on HRP enzyme which is enhanced by the action of nanoflower and produce visual color easily detected by the smartphone device in a very low concentration range. The developed assay was able to detect *S. Enteritidis* in PBS and all analyzed specimens with a detection limit of one CFU/ mL or g. Recoveries percentages of spiked milk, cheese and tap water samples with 10^2 , 10^3 and 10^4 CFU/mL from live *Salmonella* were 98.2, 96.1 and 95.4 (in milk), 94.3, 98.6 and 99.5 (in cheese) and 95.8, 101.2 and 97.8 (in water) using designed device, respectively. The effective application of this new innovation in milk and cheese indicates the possibility of its application in various food products.

Biography

Mohamed Maarouf Ali Zeinhom is an Associate Professor at Faculty of Veterinary Medicine, Beni-Suef University. He received his Ph.D. degree in Food Microbiology from Beni-Suef University in collaboration with University of Guelph, ON, Canada in July 2011. Currently, he is a visiting scholar in the School of Mechanical and Materials Engineering at Washington State University, USA. He published more than 15 papers in reputed journals. His scientific interests focus on development of rapid and sensitive nano-biosensor for detection of Food borne pathogens.