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SIMPLE METHOD TO DETECT STAPHYLOCOCCAL ENTEROTOXINS IN FISH PRODUCTS

Food borne illness from staphylococcal toxins remains a major problem world wide. Staphylococcal food poisoning follows the ingestion of enterotoxins produced during growth of toxin producing strains of this bacterium *Staphylococcus aureus* in food. Based on serological techniques, seven different enterotoxins namely, A, B, C1, C2, C3, D and E have been recognised. To confirm an outbreak of staphylococcal food poisoning, it is desirable to demonstrate the presence of enterotoxin in the implicated food.

Most foods implicated in staphylococcal food poisoning outbreaks contain low levels of enterotoxin, often less than 1 micro gram/100 g food. Traditional methods for the detection of staphylococcal enterotoxins in food such as kitten emetic test, optimum sensitivity (OSP) method and microslide immunodiffusion technique are restricted in their use because of their low sensitivity. Developments in the field of chemical immunodiagnostics have led to sensitive rapid techniques which are now being used for the analysis of food. At present the enterotoxin can be estimated by using assay kits that are commercially available.

The SET-RPLA (OXOID) test kit is based on the principle of reversed latex agglutination in which visible cross linking occure in the presence of staphylococcal enterotoxins. The test is performed in 'V' well microtiter plate. Dilutions of food extract or culture filtrate are made in five rows of wells, a volume of the appropriate latex suspension is added to each well and the contents mixed. If staphylococcal entero-

toxins A, B, C or D are present, agglutination of lattice structure which upon setting form a mat on the base of the well. If staphylococcal enterotoxin is absent or at a concentration below the assay detection level, no such mat can be formed, therefore upon setting a tight button will be observed. This phenomenon is known as reversed passive latex agglutination (RPLA)

The SET-RPLA test may be used to detect staphylococcal enterotoxins in a wide variety of foods and to give a semiquantitative result. The test may also be used to demonstrate enterotoxin production in isolates of *Staph. aureus* grown in broth culture. The studies conducted in CIFT and other parts of the world have shown that the kits are highly specific and sensitive with a minimum detection range of 0.30 to 0.75 nanogram enterotoxin/g of fish products and other food items. It is observed that the amount of enterotoxin was greater than 4 nanogram/g of food in 26 difrerent foods which were actually responsible for staphylococcal food poisoning, so it is obvious that the sensitivity of SET-RPLA kits meets the requirement for the detection of staphylococcal enterotoxin in foods associated with food poisoning outbreaks.

The outstanding features of the RPLA test are:

1. It is highly specific and sensitive (minimum detectable range of 0.30 to 0.75 nanogram / g of food).
2. It is simple, direct assaying of the enterotoxin without using complicated and lengthy extractions or concentration procedure.
3. It is rapid - takes less than 24 hours.
4. It is semiquantitative–the amount of enterotoxin can be estimated on the basis of the end point of serial two fold dilutions.
5. There is no need for expensive equipments.
6. It is economical.

However, to avoid being misled by false negative or false positive the specificity of the RPLA test must be examined with standard enterotoxin and free food extracts.

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