

# Isolation of pathogenic microorganisms



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Food handlers with poor hygienic conditions working in motels, hotels, restaurants and road side food vendors in and around Vellore could be the potential source of infection due to presence of different pathogenic microorganism in or on their body. We conducted a test to detect the pathogenic microorganisms in the nail sample of 17 food handlers. The nail samples were examined for the presence of different pathogens by standard isolation procedure. In certain samples there was formation of transparent colonies in the SS agar, indicating the possibility of presence of Shigella and Salmonella typhimurium.

Healthy human body is regularly exposed to microbes. The microorganisms regularly found on the surface of the healthy human body are countless in number and are called as ' normal flora'. When a transient flora gains entry to the human body it causes infection. The entry of the pathogenic microorganisms is usually through the food, water and many a times due to poor hygienic conditions.

Nearly 1. 9 million people die annually at a global level due to pathogenic contamination of food and water. Even in developed countries an estimated

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one third of the population are affected by microbiological food borne diseases every year.

Kaferstein and Abdussalam reported that up to 10% of the population of industrialised countries might suffer annually from food borne diseases.

Accordingly food handlers with poor personal hygiene working food serving establishments could be potential sources of infections of many intestinal helminths, protozoa, enteropathogenic bacteria. Food handlers who harbour and excrete intestinal parasites and enteropathogenic bacteria may contaminate food from their faeces via their fingers, then to food processing and finally to healthy individuals. Compared to other parts of hand, the area beneath finger nails harbours the most microorganisms, and is most difficult to clean. (B. D singh).

The poor personal hygiene of the food handlers could be the potential cause of the infection by pathogenic microorganisms. These microorganisms are transferred into the food, by these food handlers when they come in contact with the food, while serving or cooking.

A study was undertaken for the prevalence of microorganisms and intestinal parasites in the food handlers in the University of Gondar and Gondar teachers training institute, Gondar, Ethiopia. Coagulase negative Staphylococcus was predominant, with the presence of Escherichia coli, Klebsiella, Serratia, Enterobacter, Citrobacter . Shigella, Salmonella, intestinal parasites like Ascaris lumbricoides, Trichuris trichura, Giardia lamblia, Entamoeba histolytica presence was detected in the stool samples. ( Andargie G et al. 2008 Dec ).

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Another study was conducted to isolate pathogenic fungi from dermatophytic samples. Out of the 500 hundred nail and skin samples, 19 fungal species were isolated belonging to the genera *Alternaria*, *Aspergillus*, *Bipolaris*, *Cladosporium*, *Fusarium*, *Protheca*, *Rhizopus*, *Rhodoturella*, *Graphium*, *Exophiala*, *Malassezia*, *Trichosporon* and *Ulocladium*. (S. Bakeshwain et al., 2011)

Isolates of *Geotrichum* and *Trichosporum* spp. obtained from patients with a variety of dermal lesions were studied. Among 2, 202 cases examined, microorganisms of these genera were recovered from 100; there were 38 isolates of *Geotrichum* and 62 of *Trichosporum* species. Most isolations were obtained from nails: 52 cases. (Angela Restrepo and Lucia Uribe).

This study was conducted with the samples collected from the food handlers in and around Vellore district, aiming at assessing the prevalence of pathogenic microorganisms.

## **METHODS AND METHODOLOGY:**

Samples of nails were collected from the food handlers of different restaurants, motels and road side food shops. A total number of 17 nail samples were collected from the hotels and restaurants around VIT College and other places in Vellore district.

Isolation was carried out the biochemistry lab of the VIT University.

First the nail samples were inoculated into the nutrient broth and incubated for 24 hours at 37°C. After the incubation period inoculums were taken from

the different test tubes inoculated with the nail samples and marked as PBIFN 1-17 and were inoculated onto Nutrient agar.

Nutrient agar- quadrant streaking was on the different plates. After incubation different kind of colonies were obtained, having different colony morphology. The isolated colonies were taken as inoculums to be inoculated in different differential medias. Photographs were taken of the different colonies obtained.

The different medias used to inoculate with the inoculums from the nutrient agar are- EMB agar, Mc Conkey agar, SS agar. After inoculation onto these agars they were kept for incubation at 37°C for further studies.

Microscopic examination – the isolated colonies obtained was examined microscopically.

## **RESULTS:**

The samples were incubated for 24 hours at 37 °C and the further examination revealed the following results:-

The sample no. 4 showed optimum growth on the Nutrient agar, EMB agar, SS agar & Mc Conkey agar.

Nutrient agar- white and yellow colour colony formation was observed.

EMB agar & Mc Conkey- mixed cultures were observed.

SS agar- formation of colourless colonies formation was observed, which is characteristic of Shigella, Salmonella( typhimurium species) and Enterococcus faecalis.

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The samples were incubated for 24 hours and the following results were obtained:-

Nutrient agar- most of the samples show optimum growth on nutrient agar. Sample no. 10 showed irregular brown colored colonies while sample no. 12 showed yellow colored mucoid colonies.

EMB agar – sample no. 9, 10 & 11 showed green metallic sheen colour colonies, characteristic of *Escherichia coli*.

McConkey agar- sample no. 9 & 13 showed irregular lactose fermenting i. e yellow colour colony formation.

SS agar- sample no. 13 showed colorless round colonies, typical of *Shigella*, *Salmonella typhimurium* and *Enterococcus faecalis*.

## **DISCUSSION:**

In this research we are focusing our isolation techniques for pathogenic microbes like *Shigella* and *Salmonella* which are causative organism for bacillary dysentery and enteric fever respectively. For the further confirmation of the presence of the microbes biochemical tests and growth on agar like Bismuth sulphite agar or Selenite F broth is used which is typical for only *Salmonella* species growth. Only after the confirmatory tests are done we can derive exactly which microorganism is present. The results will help us enlightening the students of VIT as well as other people to know what are the possible microorganisms present in the nails of food handlers and how harmful can they get. This result is a step forward towards this aim

of informing the people of how harmful the consumption of this food can be and what can be done to prevent the spread of such diseases.