

# **Palm Impression Technique: A Simple Tool to Popularize Good Hygiene and Sanitation Practices among Fish Handlers**

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In order to ensure the safety of the fish consumer, it is of utmost importance to popularize good sanitation and hygiene practices among fish handlers, viz., crew of the mechanized trawlers, traditional boat operators, loading and unloading workers at the fishing harbour and fish vendors. Since most of the fish handlers are educationally backward, the conventional bacteriological techniques to demonstrate bacterial load are beyond their level of comprehension. A simple, participatory technique, the Palm Impression Technique (PIT), was found to be an effective tool for popularizing good hygiene and sanitation practices, among these fish handlers. PIT was demonstrated on fishing boat and fish landing centre and the results were easily grasped by the fish handlers. PIT is recommended for use in extension programmes for on-site demonstrations in fish markets, landing centres, fishing vessels, fishing villages, peeling sheds and processing plants.

**Key words:** Palm impression technique, hygiene, sanitation, fish handling

In order to ensure the safety of fish consumer, stringent hygienic and sanitational steps are recommended. Safe food means lower incidence of food borne diseases, low public health costs, fewer barriers to international trade, lower production losses and better competitiveness. The primary fish handlers viz., crew of mechanized trawlers, traditional boat operators, loading and unloading workers at fishing harbour and fish retailers must be educated on good hygiene and sanitation practices, as they directly handle fish at one stage or the other. Most of them are unaware that they are potential carriers of pathogenic microorganisms

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and that poor personal hygiene makes the fish unsafe for human consumption. Moreover, physically it is almost impossible to distinguish between 'unsafe fish' and 'safe fish', as both look normal, smell normal and taste normal (Forsythe, 2000). In spite of repeated efforts through lectures, discussions and exhibitions, the hygiene literacy gained little momentum amongst the fish handlers as they had little knowledge of microorganisms. The conventional bacteriological technique to demonstrate the total bacterial load on worker's palm by swabbing method was beyond their level of comprehension. A simple participatory technique whose results can be read by illiterate or less educated people was needed to create awareness on hygiene and sanitation among fish handlers. In this paper, a simple tool for creating awareness on hygiene and sanitation among the fish handlers and its effectiveness are discussed.

### Materials and Methods

Palm Impression Technique (PIT) was done by placing the palm of fish handler on a large sized petridish preset with nutrient medium. Briefly, 50 ml of molten Tryptone Glucose Agar (tryptone 0.5%, beef extract 0.3%, sodium chloride 0.5%, D-glucose 0.1%, agar-agar 1.5%, pH 7.1±0.1) was poured in large sized petridishes (195 mm dia.), allowed to set and dried under laminar flow for 45 min.

Table 1. Profile of fish handlers (n=54)

Characteristics	Number	Percentage
<b>Sex</b>		
Male	37	69
Female	17	31
<b>Age (years)</b>		
< 35	40	74
36 - 45	8	15
> 45	6	11
<b>Education</b>		
Illiterate	4	7
Read and write	7	13
Primary school	23	43
Higher secondary school	14	26
College level	6	11
<b>Occupation</b>		
Traditional boat operators	10	19
Crew of mechanised trawlers	11	20
Loading and unloading workers at fishing harbour	10	19
Small scale fish vendors	12	22
Unemployed youth	11	20

The palm of the fish handler, before and after washing, was then placed on the agar and allowed to remain in contact for 30 sec. The plates were then incubated at 37°C and after 24 h, the plates were observed for visible bacterial growth.

A sample of 54 fish handlers from Pedajalaripeta and Newjalaripeta fishing villages and Visakhapatnam fishing harbour were selected for this demonstration, using simple random sampling method (Table 1).

### Results and Discussion

Food borne illness occurs when a person gets sick by eating food that is contaminated with unwanted microorganisms or toxins. It is estimated that 1 in 50 people shed pathogens like *Salmonella*, *Shigella*, pathogenic *Escherichia coli*, *Staphylococcus aureus*, Norwalk like viruses, Hepatitis A virus, *Giardia lamblia*, etc., either in faeces ( $10^9$  pathogens per g of faeces), skin infections ( $10^8$  organisms per drop of pus), cough ( $10^5$  *Streptococcus pyogenes* per cough) or in vomit (Snyder, 1995). Poor hygiene such as failing to wash hands properly after going to the toilet can leave  $10^7$  pathogens under the fingernails. It is of utmost importance to popularize good hygiene and sanitation practices, among fish handlers, so that they are able to apply the same during harvesting, handling, processing and sale of fish. Most people retain 10 to 15% of what they had heard, 30 to 35% of what they had seen, 50% or more of what they had seen and heard and upto 90% by participating with the involvement of all the senses (Marks, 1955). The palm impression technique was developed to facilitate understanding of the importance of good hygiene and sanitation practices, among fish handlers.

In the palm impression technique, the fish handlers were asked to place their soiled palm on preset agar plate. They were then directed to wash their hands thoroughly with soap and water. After drying their palms, they were once again asked to place their palms on a different agar plate. The results, when observed after 24 h, were very striking to the fish handlers. The plate on which unclean palm was placed showed very dense bacterial growth, in the shape of the fish handler's palm, whereas the plate on which clean palm was placed showed negligible bacterial growth (Fig. 1). All the fish handlers easily read the result and understood the difference in the bacterial load on their palms brought about by thorough washing of their hands. This can have an everlasting impression in their minds, which in turn makes them follow good personal hygiene.

The PIT can be employed in extension activities for popularizing hygiene and sanitation. The PIT was demonstrated to the crew of mechanized trawlers on the fishing boat itself. For this, they were asked to place their washed palms on the unclean boat deck and place the same palm on the agar plate. Later, they

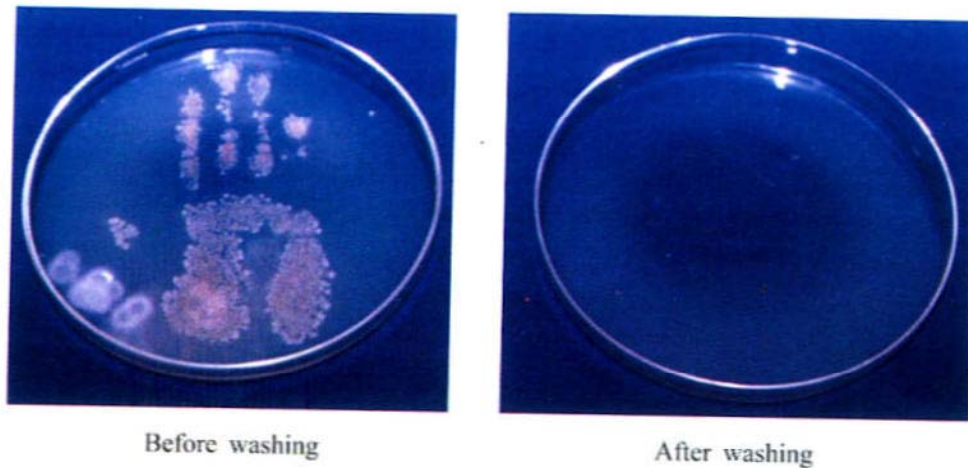


Fig. 1. Results of palm impression technique showing clear and visible difference between unclean and clean palm

Table 2. Awareness on hygiene and sanitation aspects, before and after PIT demonstration (n = 54)

Item	Before PIT demonstration		After PIT demonstration	
	No.	Percentage	No.	Percentage
Fish handlers are potential carriers of pathogenic microorganisms	8	15	48	89
Food borne illness occurs when food eaten is contaminated with unwanted microorganisms or toxins	4	7	46	85
Poor personal hygiene makes the fish unsafe for human consumption	12	22	54	100
Failing to wash hands properly after going to toilet can leave a pathogenic bacterial load on the palms and under finger nails	3	5	52	96
Unclean boat decks, floors, crates, utensils and tables are loaded with bacteria	4	7	50	93
Microorganisms are the important cause of fish spoilage	6	11	42	78
Cleaning fish and surfaces with dirty water makes the fish unsafe for humans	28	52	54	100

were instructed to clean the deck by hand brushing, cleaning with 'teepol' and chlorinated water and allow it to dry. Once again they were asked to place their clean palms on the washed deck surface and later on, on another agar plate.

The results when read on the following day, showed that unclean deck was loaded with bacteria whereas properly washed deck had lower bacterial load. The crew was convinced of good hygienic practices only after seeing the difference in bacterial load on the deck surface, before and after cleaning. The PIT was demonstrated to fisherfolk at fish landing centre, Pedajalaripeta. It was employed to convince them that clean fish carries a lesser microbial load than unclean or soiled fish. In this case, instead of the fisher woman's palm, soiled fish and clean fish were pressed on the agar surface and incubated at 37°C for 24 h. After observing the result, they were convinced that fish cleaned in dirty waters or kept on soiled surfaces carry a higher bacterial load, which not only spoils the fish but also makes them unsafe for consumption.

Awareness on hygiene and sanitation aspects before and after PIT demonstration, as expressed by them, is presented in Table 2. The encouraging factor that could be observed from the table was that the demonstration had yielded appreciable results in making fish handlers aware of the importance of hygiene and sanitation aspects. The result of palm impression technique had a definite impact on the different categories of fish handlers. Their mental disposition towards hygiene and sanitation changed positively. There was increased awareness of food safety as they realized that poor personal hygiene and poor handling make the fish unsafe or unacceptable for human consumption and affect their income.

Since the PIT involved the participation of the fish handler at all stages, the results were highly communicative and meaningful. The technique can be used for on-site demonstration either in fish markets, landing centres, fishing vessels, fishing villages and peeling sheds. The technique was found to be simple as well as an effective tool that can be widely recommended for use in extension programs for popularizing good hygiene and sanitation practices among fish handlers.

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