

## ORIGINAL RESEARCH ARTICLE

**Isolation and Identification of Fungal Strains from Lake Soil in and Around Ranipet Area, Vellore District****Dr.A.Panneerselvam\* and G.Arumugam***Department of Zoology, Thiruvalluvar University, Serkkadu-632115, Vellore, Tamil Nadu, India*

Received 26 Sep 2012; Revised 04 Dec 2012; Accepted 12 Dec 2012

**ABSTRACT**

Humans are in contact with soil permanently, either directly or indirectly via food, water. Therefore soil acts as a major vector and serves as a major source of disease causing agents to humans. The aim of the present study the prevalence of fungal contaminants from lake soil in and around Ranipet, Vellore District and associated risk factors. The collected samples were processed for fungal isolation using the Potato dextrose agar, and Sabouraud dextrose agar. The conventional methods of swabbing and streaking were used. Pure colonies of isolates organisms were identified and characterized using standard microbiological technique. The fungal were isolated from soil samples yielded 20 isolates representing 4 different types of fungal species viz., *C.albicans*, *C.tropicalis*, *A.niger*, *Trichophyton sp.* From this study it was concluded that the soil is commonly contaminated with microbes and this contamination may be playing a major role in the transmission of potentially harmful organisms.

**Key words:** Microorganisms, contaminated, soil, fungal.**INTRODUCTION**

Humans are in contact with soil permanently, either directly or indirectly via food, water and air; and thus soil may act as a vector and source of important human disease agents. Although many of the diseases associated with soils have been well characterized and studied, enteric diseases and their link to soil have been understudied and possibly underestimated. In order to clarify this connection, diseases associated with soil have been classified depending on the origin (Weissman *et al.*, 1976) of the etiological agent as follows: (1) soil-associated diseases which are caused by opportunistic or emerging pathogens that belong to the normal soil microbiota (e.g. *Aspergillus fumigatus* is a very common fungus occurring in soils and can infect the lungs via inhalation of spores), (2) soil-related diseases, which result in intoxication from the ingestion of food contaminated with entero- or neurotoxins (*Clostridium botulinum*, *C. perfringens* and *Bacillus cereus* are some examples of these pathogens), (3) soil-based diseases caused by pathogens indigenous to soil (which include *C. tetani*, *B. anthracis*, and *C. perfringens*) and (4) soil-borne diseases caused by enteric pathogens

which get into soil by means of human or animal excreta.

Fungi are eukaryotic microorganisms. Fungi can occur as yeasts, molds, or as a combination of both forms. Some fungi are capable of causing superficial, cutaneous, subcutaneous, systemic or allergic diseases. Yeasts are microscopic fungi consisting of solitary cells that reproduce by budding (Baron, 1996). Molds, in contrast, occur in long filaments known as hyphae, which grow by apical extension (Aggarwal, 2010). Hyphae can be sparsely septate to regularly septate and possess a variable number of nuclei. Regardless of their shape or size, fungi are all heterotrophic and digest their food externally by releasing hydrolytic enzymes into their immediate surroundings absorptive nutrition. In the present investigation on isolation and identification of various types of fungi from lake soil in and around Ranipet area.

**MATERIALS AND METHODS**

The Ranipet, Sipcot industrial complex was established during the year of 1973. The industrial complex was phase -I and phase -II where petrochemical, ceramics, bulk drugs and pharmaceuticals. Heavy engineering foundry, chemical, tanneries and miscellaneous industries

are located. The Ranipet Town is located at 12.56° Northern latitude and 79.20° Eastern longitude; it is geographically 25 Km away in North East of Vellore, the district Headquarters of Vellore District.

**Sample collection**

Samples were collected from different parts of BHEL, Ranipet, Vellore, Tamilnadu, India during March 2012. The samples were collected from the different habitats like lake water and sediment soil at the depth of 10-25 cm. Samples were collected in sterilized plastic bags/bottles and brought to the Zoology Research Laboratory, Thiruvalluvar University, Vellore, T.N, India, and stored in a refrigerator at 4°C up to further processing.

**Isolation of fungal species from soil samples**

By using inoculation needle, the samples were streaked for the growth of isolated colonies on potato dextrose agar. Then the plates were incubated at 37 °C for 24 hrs for fungal. After 24 hrs the colonies grown on the plates were examined for their morphology and the same colonies were used for staining.

**Characterization of fungal species**

The isolated fungal species further identified and then characterized by using standard microbiology method.

**RESULTS**

The samples were collected from Karai and Puliyaandal Lake and they were processed to identify the microorganisms present on the contaminated soil. The results of the isolations are presented in (Table 1). The fungal species were isolated from soil samples yielded 20 isolates representing 4 different types of fungal species viz., *C.albicans*, *C.tropicalis*, *A.niger*, *Trichophyton sp.* The microscopic characteristic of culture morphology of selected microaeroflora such as *C. albicans*, *C. tropicalis* *Aspergillus niger*, *Aspergillus flavus* and *Trichophyton sp* was studied and tabulated in (Table 2).

**Table: 1 Cultural and morphological characteristics of the fungal isolates**

Sample	Growth At 37	Spore formation	Germ tube	Microscopic observation	Fungal sp
Water A	+	-	+	Yeast cell	<i>C.albicans</i> <i>C.tropicalis</i> <i>A.niger</i>
	+	-	-	Yeast cell	
	-	+	-	Septate hypae	
Water B	-	-	-	Septate hypae	<i>A.niger</i> <i>Trichophyton</i> <i>C.alpicans</i>
	+	-	-	Macrocanida	
	+	-	+	Yeast cell	

Water-A: Karai ; Water-B: Puliyaandal

**Table 2: Carbohydrate fermentation test for the Candida isolates**

Sample	Species	Sugar fermentation			
		Dextrose	Maltose	Sucrose	Lactose
Water A	<i>Candida albicans</i>	AG	AG	A/-Ve	-Ve
	<i>Candida krusei</i>	-	AG	-Ve	-Ve
	<i>Candida albicans</i>	AG	AG	A/-Ve	-Ve
Water B	<i>Candida tropicalis</i>	AG	AG	AG	-
	<i>Candida albicans</i>	AG	AG	AG	-

AG- Acid / Gas; Water-A: Karai; Water-B: Puliyaandal

**DISCUSSION**

Diseases particularly microbial diseases are increasing day by day. Diagnostic and treatment measures are also increasing trend. Antibiotics are gaining more importance from time to time of its first discovery for treatment of bacterial and fungal diseases.

This study was carried with an aim to isolate fungi from samples such as soil collected from different environment such as Lake, Areas surrounded by more industries, houses with thick population area. From this study has clearly indicated that the lake area is highly contaminated by fungus. The fungi isolated in this study are known to present in all sorts of environment of human involvement. Majority of them are human as well as animal pathogen. The soil analyzed in his study has clearly shown that they are loaded with indicator organisms, which are indication of fecal pollution and thus the human interference (McQuaig *et al.*, 2006)

The fungi predominant in lake are largely derived from soil course (Boer *et al.*, 2005). Basically the fungi are responsible for the degradation of organic and inorganic compounds. They derive their nutritional requirement from the compounds presented to them in the waste soil. They are able to synthesize their enzymes, metabolic intermediates, structural proteins, lipids and nucleic acids from carbon compounds (Ali and Naseem, 2012) in the feed, together with other elements. They derive their energy from oxidizing either organic compounds (chemoorganotrophic metabolism), or inorganic compounds (chemolithotrophic metabolism), such as reduced sulfur or nitrogen compounds. They use the energy for their bodily functions, reproduction and growth.

In conclusion, the soil of the lake at Ranipet is subjected to soil pollution and monitoring of microbial quality of soil is a must to control the spreading of pathogen transmitted by contaminated soil. This study has strongly suggesting that the microbiological standard of lake soil must be developed to a large extent to confirm the health standard.

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