

The Aquatic Fungi are growing in various water bodies. They occur in streams and rivers and become a part of lotic ecosystem and also occur in ponds, ditches, pools and lakes within lentic ecosystem. They are also found at the margins, as well as strictly terrestrial habitats. The aquatic fungal population in freshwater and marine water, consists of representatives of Mastigomycotina, Deuteromycotina, Ascomycotina and Basidiomycotina (Sparrow, 1968). These fungi have, either saprophytic or parasitic mode of nutrition. The saprophytic members growing on a variety of substrata like plants and animal remains, snake skin, insect bodies, on aquatic bodies and animals, hair and feathers in water. It is believed that, increase in occurrence of aquatic fungi is mainly due to increase or addition in organic matter, domestic and agricultural wastes in waterbodies, disturbances in mud and scum and the water bodies with more industrial influents.

These fungi occur on a wide variety of substrates of freshwater and also marine waters. Kohlmeyer (1974), defined those fungi as "marine" which grow and reproduce in marine habitats. He further divided marine fungi into 'obligate' and 'facultative' marine fungi. Facultative marine fungi, are able to grow in marine environment. The obligate marine fungi are those, which grow and sporulate exclusively in marine habitats. "Marine fungi" is not a natural taxonomic group, but consists of a heterogenous assemblage of species growing in marine habitats.

Aquatic fungi are divided into two groups, based on their biology. The first is "Ingoldian Fungi" and second group is called "Aero-aquatic Fungi". The Ingoldian fungi are found growing on submerged leaves, stems, woods and twigs, in well-aerated bodies of water. The conidia are produced under water and when are freed, become trapped in surface foam, produced by water action. Aero-aquatic fungi survive, in water and mud of low oxygen level and colonise on new substrates. They are formed at the air - water interface, where they are produced. These include the helicosporus aquatic hyphomycetous fungi.

Aquatic fungi are filamentous and mostly moniliaceous, conidia forming fungi. (Bhatt, 1998). Their conidia are characteristically shaped, either tetra-radiate, sigmoid, coiled, appendaged or branched one (Ingold, 1942).

De Wildeman (1893), recognized the spores of fungi, found in water. Ingold (1942-75), carried out an outstanding work on microfungi, found in running streams and rivers. Descals and Webster (1981), later on fondly referred, this unique group as an 'Ingoldian Fungi'. In freshwater habitats, they are represented by 2 major groups, namely Saprolegniales (water moulds) and aquatic Fungi - Imperfecti (Hyphomycetes). A number of other Mastigomycetes (zoosporic fungi) and a few Basidiomycetous members too.

In the dynamic of freshwater stream ecosystem, hyphomycetes fungi are most important. (Barlocher and Kendrick, 1974) Aquatic fungi play very important role in recycling the inorganic food substances. Their role in food chain formation is very significant. The process of degradation of organic matter by fungi and fauna, living in water and also on land.

In the present investigation, the study of aquatic fungi around Satara city and in Satara district has been carried out. Satara is one of the districts of Maharashtra state and some part of it, occur in Western Ghats. Satara is placed in the cushions of Sahyadri ranges. It is situated 16° 51' to 18° 10' N latitude and 73° 45' to 75° 0' E longitude and 696 meters above mean sea level. It is situated at Westwards of Sahyadri ranges and the highest peak Mahabaleshwar is situated in the district.

Satara district covers, 1,00,962 sq.km. area. [Gazetter of Satara district, 1991] Due to peculiar geographical peculiarities, it enjoys all types of environmental conditions. The Krishna, Koyana, Venna, Sarswati, Savitri rivers originate in Mahabaleshwar and Urmodi at Kas enrich the basins with evergreen vegetation. There are number of streams and waterfalls like Pateghar, Thoseghar, Ozarde, Lingmala, Mahabaleshwar etc. Lakes such as Pingali, Venna, Kas. Ponds and dithches such as Godoli, Mangalwar, Moti talav, Phutaka talav, Hatti talav, Mahardare talav, a pond near collector's office, Satara city etc., which remain full of water throughout the year but some vanish in summer. All these rivers, streams, lakes provide cool and moist temperature to the vegetation outside and inside the reservoirs throughout the year and flourish well.

The rain water flows, through various rivers, streams, water falls etc. Some water is gathered in ponds, ditches, puddles, lakes etc. Numbers of aquatic fungi grows in water and flourish on substrata like insects, decaying stems pieces, leaves, floating in water etc.

Soil: The soils in Satara District vary from tract to tract. It belongs to 3 main classes viz. reddish brown soil in the hills, black and light coloured soil in the plains, depending on the nature of underlying rocks. The red clayey soil in the Sahyadri hill ranges is formed from disintegration of laterite. The typical laterite soil found in Mahabaleshwar and on the higher ridges of Sahyadri. Black cotton soil is found in the central part of Satara district.

Rainfall: The rainfall varies in different parts of district. The South – West monsoon, is the main source of rainfall, begins about the first week of June and it showers till the end of September. About 85% of the rainfall occurs during these months only. The Eastern belts depend chiefly on an irregular storms between mid May to mid June and October and November from the North - East monsoon. Some North - East rains, occasionally, shower in December and in March - April. Close to Sahyadri and in the central belts, the rainfall is heaviest and in the eastern belt, which is rather scanty form. The east wards regions like Phaltan, Dahiwadi, Khandala and Man ranges (mountains of Mahadeva) receive below 80mm rainfall per annum. While, as compared to Karad and Wai, the Satara region receives 80 – 1250mm rainfall per annum. Patan and Satara (westward) regions, receives high rainfall upto 1250 – 2000mm per annum. The Mahabaleshwar plateau receives above 2500mm rainfall per annum. Thus, there is plenty of water in the water reservoirs almost throughout the year in which fresh water fungi grow and flourish. [Gazetter 1991, Arunachalam 1967, Deshpande1972]

Temperature: The temperature variations occur from season to season and also day and night. In winter, (cool weather) daily temperatures are, in between 15° C to 21° C or sometime even less. But, during the month of January, the temperatures fall upto 8° C. In summer (hot weather) season, the maximum temperature is upto 35 - 40° C in the month of April – May. In Mahabaleshwar, during winter season, the temperature, fall upto 5° C and in summer it is almost remains normal, as compared to other areas. The average temperature is upto 37° C. In this way, temperature variation may affect the growth of different aquatic fungi.

Humidity: Humidity varies considerably during the day and night. Presence of water vapour makes air humid. Humidity refers, to that state of atmosphere in which water

vapour is present. During monsoon months, the air is highly humid, but in the summer and cold seasons, the air is dry, particularly in the afternoon. The humidity changes from 31% to 83% in the morning and 21% to 79% in the evening. The highest humidity recorded is 100% in July – August. [Gazetter of Satara district, 1991]

Aquatic vegetation: (Fungi)

The occurrence and distribution of aquatic fungi is regulated by interactions, among environmental conditions, by substrate availability and density of predatory and invertebrates. Their high distribution, directly co-related to the density of aquatic fungi. They play, an important role as plant colonizers and contribute significantly in the processing of the plant litter detritus. The aquatic fungi play important role, as in the productivity of an aquatic ecosystem considering the heterotrophic nature of fungi. It seems that, their key role in aquatic environment is concerned in the utilization and transformation of organic matter. The fungi most commonly observed on decaying leaves in streams are typical aquatic hyphomycetes. They are important in the breakdown of the organic matter. There is a seasonal occurrence of an aquatic fungi, they well occur in the rainy season and autumn at various temperature and humidity. The rain water flows and remains in all water bodies. The fallen leaves are carried with the water. It is in autumn, when the streams receive a great supply of tree leaves, the aquatic fungi are dominant at least in the early stages of decay. (Barlocher, 1992)

In the present investigation, the different water bodies of Satara district were studied, for aquatic fungi. There are some permanent water bodies which are full of water throughout the year. Some ponds and ditches vanish in summer but still there are sources of water bodies such as streams of Pateghar, Mahabaleshwar, rivers such as Krishna., Koyana, Urmodi etc. and lakes like Kas. which is full of water. There are favourable conditions for growth of the aquatic fungi, particularly the climate and vegetation are important in the life cycle of aquatic fungi. Large amount of leaves, stem pieces, invertebrates flow through the water stream and settle in reservoirs, on which various groups of aquatic fungi grow. There is a continuous source of water in Western Ghats as well as vegetation (leaf litter) favour the growth of various forms of fungi throughout year.