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A PRELIMINARY SURVEY OF SEWAGE ALGAE FROM KARACHI

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The oxidation pond technology has provided a low cost and efficient method for the treatment of waste water to those communities which could not build conventional waste water treatment plants. Nearly 5,000 small communities in United States use waste stabilization ponds for the treatment of municipal waste. In Pakistan, very little effort has been made to introduce oxidation pond technology for the reclamation of sewage water. One oxidation pond is in operation at Lahore and another has recently been commissioned in Karachi University Campus. Except for one report (Ahmed, 1974) the data regarding the distribution of algae, their relative abundance and the seasonal variation in waste water from Pakistan is also non existent.

This paper presents a preliminary survey of algae in sewage water of KMC treatment plant at S.I.T.E. area and Karachi University Campus.

Materials and Methods

Liquid waste water samples were collected every third day in plastic bottles from different locations of Karachi Municipal Corporation (KMC) treatment plant (pH 7.2-8.2) and the residential area of Karachi University (K.U.) Campus (pH 6.7-8.2).

They were collected from superficial layers, pH of the sample was determined by Orion digital pH meter. A portion of the sample was centrifuged at 4,000 rpm for 5 minutes and pellet was examined under microscope for the identification of algae, which were determined after Fritsch (1948), Desikachari (1959) and Prescott (1962).

Results and Discussion

Thirty two species were identified from KMC treatment plant, 6 belonging to Chlorophyta and 26 to Cyanophyta (Table 1). In sewage effluent collected from Karachi University Campus, the same number of algal species were identified. Out of these 7 belonged to Chlorophyta and 25 to Cyanophyta. Table 1 also shows the relative abun-

Table 1. Occurrence of various algal species in sewage waters.

Algal species	KMC plant	K.U. Campus
Chlorophyta		
<i>Chlamydomonas angulosa</i>	++	—
<i>Chlamydomonas globosa</i>	++	++
<i>Chlamydomonas</i> sp.	—	++
<i>Chlorella ellipsoidea</i>	++	—
<i>Chlorella vulgaris</i>	+++	+++
<i>Chlorella</i> sp.	++	—
<i>Chlorococcum humicola</i>	+	+++
<i>Crucigenia</i> sp.	—	++
<i>Ionoraphidium</i> sp.	—	++
<i>Scenedesmus</i> sp.	—	++
Cyanophyta		
<i>Aphanocapsa littoralis</i>	++	—
<i>Aphanothece</i> sp.	++	—
<i>Arthrospira platensis</i>	—	++
<i>Chroococcus minor</i>	++	++
<i>C. minutus</i>	++	++
<i>Gloeocapsa</i> sp.	—	++
<i>Gloeothece</i> sp.	—	++
<i>Hapalosiphon hibernicus</i>	++	+
<i>Lyngbya</i> sp.	++	++
<i>Merismopedia minima</i>	++	—
<i>Merismope lia</i> sp.	++	++
<i>Microcystis</i> sp.	—	+
<i>Oscillatoria boryana</i>	—	++
<i>O. chlorina</i>	++	+++
<i>O. curviceps</i>	++	+
<i>O. granulata</i>	+++	+++
<i>O. limnetica</i>	+++	+++
<i>O. linosa</i>	+++	+++
<i>O. obscura</i>	++	++
<i>O. subbrevis</i>	+++	+++
<i>O.</i> sp.	++	+++
<i>Phormidium ambiguum</i>	++	++
<i>P. molle</i>	++	—
<i>P. mucosum</i>	+++	+++
<i>P. retzii</i>	++	—
<i>P. stagnina</i>	++	++
<i>P. valderianum</i>	++	++
<i>P. tenue</i>	+++	+++
<i>P.</i> sp.	++	++
<i>S. irulina gigantea</i>	++	—
<i>S. laxissima</i>	++	++

(+++ = dominantly occurring, ++ = frequently occurring, + = occasionally occurring, — = Lacking).

dance of various algal species. The algal species were classified as dominantly occurring, frequently occurring and occasionally occurring on the basis of their number in microscopic field.

This study also reveals that the dominant algal flora of the two locations are more or less identical. The only exception was of *Chlorococcum humicola* which was occasionally found in samples collected from KMC treatment plant. In case of other algae it was observed that *Chlamydomonas angulosa*, *Chlorella ellipsoidea*, *Chlorella* sp., *Aphanocapsa littoralis*, *Aphanothece* sp., *Merismopedia minima*, *Phormidium molle*, *P. retzii* and *Spirulina gigantea* were present in KMC treatment plant while they were completely absent in sewage water of Karachi University Campus. The algal species which were present in Karachi University Campus but absent in KMC treatment plant were: *Chlamydomonas* sp., *Crucigenia* sp., *Monoraphidium* sp., *Scenedesmus* sp., *Arthrospira platensis*, *Gloeocapsa* sp., *Gloeotheca* sp., *Microcystis* sp., and *Oscillatoria boryana*.

The results presented in this communication could not be compared with the observations of Ahmed (1974), because he studied the algal flora of oxidation ponds, whereas, this paper deals with algae found in sewage waste.

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