

**POLLUTION TOLERANT PLANTS FROM SALIM ALI LAKE,  
AURANGABAD, MAHARASHTRA.****<sup>1</sup>\*Sangeeta Ahuja and Narayan Pandhure<sup>2</sup>**<sup>1</sup>Department of Botany, Sir Sayyed College, Aurangabad.<sup>2</sup>Department of Botany, Dr. BAMU, Aurangabad-431001.Article Received on  
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**\*Corresponding Author****Dr. Sangeeta Ahuja**Department of Botany, Sir  
Sayyed College,  
Aurangabad.**ABSTRACT**

One of the most important environmental areas is the quality of life giving water. Knowledge of the qualitative and quantitative composition of water is the first step to reveal the nature of the particular environmental problem. The present paper deals with the identification of pollution tolerant aquatic plants growing in the water environment of Salim Ali Lake, Aurangabad. During the investigations it was observed that 42 aquatic plants species, out of which 22 species belonged to Dicotyledons and 12 plant species of monocotyledons representing 24 families. Dicot dominates over monocot in the ratio of

5: 3. The Collected species have been documented and arranged in alphabetical order according to local names, Latin names, family, flowering periods, dominance and distributional pattern and medicinal use. The following species were recorded in this locality, e.g. *Ceratophyllum demersum*, *Hydrilla verticillata*, *Leersia hexandra*, *Nymphaea mouchali*, *Nymphoides cristatum*, *N. indicum*, *Pistia stratiotes*, *Vallisneria spiralis* and different species of *Cyperus*. Plants like *Pistia stratiotes*, and *Hydrilla verticillata* have already proved to be as Hg (II) and Cr (VI) accumulators. These plants can be utilized for removal of the heavy metal pollutants from the polluted water bodies without endangering the lives of other flora and fauna. It may be concluded that these aquatic plants, which employ solar energy, can be utilized for the scavenging of heavy metals from waste water for water purification.

**KEYWORDS:** Pollution tolerant plant species, Salim Ali Lake, Aquatic Plants.**INTRODUCTION**

Water is essential for life in both the biochemical and biophysical senses and its influences are both internal and environmental. It is not only the most abundant single substance in the

biosphere but probably is the most remarkable as well. The water environment can generally be characterized as a dilute, aqueous solution, containing a large variety of organic and inorganic chemical species, dissolved and in suspension, and including a variety of plant and animal life. Knowledge of the qualitative and quantitative composition of water is the first step to reveal the nature of the particular environmental problem. One of the most important environmental areas is the quality of life-giving water. Now a day lakes are degraded by both natural and anthropogenic activities, which deteriorate their quality, and push them to the bank of extinction. In this process of unplanned human developmental activities initiated the need of suitable conservation strategies. Normally, lakes perform the functions directly related to their physical, chemical and biological integrity to decide quality status of water. The present piece of research work is initiated on pollution status at Salim Ali Lake by interference and increase in the population of phytoplankton and microbe. Salim Ali Lake is popularly known as Salim Ali Talab or Abari Houd and located near Delhi Gate Aurangabad. It is situated in the northern part of the city. During the Mughal period it was known as Khiziri Talab. Later on it has been renamed after the great ornithologist, naturalist Salim Ali and also known as birdman of India. Salim Ali Lake comprised a rare and rich biodiversity spot within the city. Salim Ali lake is very much interesting with regards to vegetation because of the fact that the floristic compositions of this locality are mixed type having both terrestrial and aquatic which are yet to be explored. No systematic and extensive floristic works on this lake have been done except for a few scattered reports. The present paper deals with the selection of pollution tolerant aquatic plants growing in the water environment of Salim Ali Lake, situated in Aurangabad District of Maharashtra.

## 2. MATERIALS AND METHODS

The present work is based on the results of extensive systematic field studies of the plants of this area for a period of three years (May 2005-April 2008). Field trips were made once in a week covering the entire area with a view to find out the aquatic plant species and their ecological features. Field observations were recorded like habit, habitat, association and frequency in the field, available local names, as well as flowering and fruiting periods of the investigated taxa. The plants have been identified from fresh materials with the help of different Floras (Naik; Cook). The collected specimens were then poisoned, pressed and dried. After drying, the plants were mounted on the herbarium sheets and labeled properly for future use. Plants were authenticated from BAMU herbarium.

## RESULTS AND DISCUSSION

The physico-chemical properties of freshwater bodies are characteristic of the geochemical, climatic, geomorphological and pollution conditions (largely) prevailing in the drainage basin and the underlying aquifer. The biota in the surface water is governed entirely by various environmental conditions that determine the selection of species as the physiological performance of the individual organisms. The primary production of organic matter, in the form of phytoplankton and macrophytes is more intense in lakes and reservoirs than in rivers. In contrast to the chemical quality of water bodies, which can be measured by suitable analytical methods, biological quality is a combination of both qualitative and quantitative characterization. The sample collected should be small in volume, enough to accurately represent the whole water body. The water sample tends to modify itself to the new environment.

During the present investigation minimum and maximum along with average values of physico-chemical parameters of the water temperature plays important role in controlling the occurrence and abundance of blue-green algae. The dissolved oxygen content was the highest during water at all 03 stations of lake as agreed with earlier workers. In present study, BOD fluctuated directly with water temperature and PH of all 03 stations lake (Table 1). Present investigation all 03 stations of lake showed alkaline in nature. The concentrations of nitrate and phosphate were greater at all 03 stations of lake. The concentration of nitrate, phosphate and sulphate indicated the higher concern of pollution at all 03 stations of lake. The abundance of blue-green algae during winter and summer confirmed the earlier observations Moore, et, al 1980.

Salim Ali Lake has been situated in the north of Aurangabad city. Sewage and effluent from Cidco, Hudco and other areas have been added in this water body which makes it polluted. Municipal Corporation has taken efforts to make it pollution free but pollution has not been controlled. Ecosystem has got its mechanism to control the pollution. During preliminary investigations it was observed that some plant species are growing luxuriantly in Salim Ali Lake. Hence it was decided to work on plant which tolerates the pollution. During the investigations 44 aquatic plants were recorded out of which 18 species belongs to Dicotyledons and 16 species of monocotyledons representing 27 families.

The species documented were *Aeschynomene American*, *Alternanthera sessilis*, *Ceratophyllum demersum*, *Bacopa monnieri*, *Ceratophyllum demersum*, *Eichhoruia crus-galli*,

*Hydrilla verticillata*, *Leersia hexandra*, *Nymphaea mouchali*, *Nymphoides cristatum*, *N. indicum*, *Pistia stratiotes*, *Vallisneria spiralis* and different species of *Cyperus*. Plants like *Pistia stratiotes*, *Eichhornia crassipes* and *Hydrilla verticillata* etc. These plants remove pollutants from water body and grow well. These plants can be utilized for removal of pollutants from the polluted water bodies without affecting its flora and fauna.

**Table: 1** The range and averages values of Physico-chemical parameters at three stations of Salim Ali Lake

Sr. No.	Parameters	Sampling Stations					
		S1		S2		S3	
		Range	Average	Range	Average	Range	Average
01	Temperature	18 <sup>0</sup> -36 <sup>0</sup>	21.5 <sup>0</sup>	18-35.3 <sup>0</sup> C	22 <sup>0</sup> C	18-5 <sup>0</sup> -36 <sup>0</sup> C	22 <sup>0</sup> C
02	PH	7.1-8.5	7.5	7.2-8.4	7.6	7.3-8.6	7.7
03	Free CO <sub>2</sub>	00-62	40.5	00-66	35	00-60	30
04	DO	3.2-8.9	-4.1	4.2-8.5	4.2	6.5-8.8	5.2
05	BOD	1.63-14.2	8.3	2.50-P4.5	9.4	2.40-16	11.2
06	Carbonate	00-70	30.5	00-100	40.2	00-120	42
07	Bicarbonate	80-240	110	90-300	105	100-340	120
08	Alkalinity	150-410	150	120-420	160	150-440	165
09	Chloride	18.60-61.5	22	17-55	23.5	18-86	245
10	Hardness	110-230	130-5	120-250	140.7	126-270	145.5
11	Calcium	20-70.8	30-5	22-80.2	33-7	21.75.5	34.4
12	Magnesium	7-40.5	20.5	8.42-5	21.5	10-45.5	23.2
13	Nitrate	0.02-0.9	0.25	0.03-.85	0.32	0.01-0.92	0.34
14	Phosphate	0.60-0.85	0.73	0.62-.82	0.74	0.7-0.85	0.76
15	Sulphate	0.4-0.75	0.55	0.5-.80	0.62	0.45-0.85	0.63
16	Total Solids	350-820	410.5	420-1100	910	230-8.70	477.5

\* All parameters are expressed in mg/l except water temperature and PH



*Echinochloa-crus-galli millet*



*Hydrilla sp*

*Pistia stratiotes**Stachytarpheta jamaicensis*

## DISCUSSION

These plants can grow fast in the sewage effluents or in rich organic pollutant water-bodies, which can act as biological filter in sewage effluent. Plants like *Wolffia*, *Lemna* and *Spirodela* of the family Lemnaceae have also been utilized as fresh fish feed and they resulted in good fish production. Some of the aquatic plants like *Pistia stratiotes*, *Eichhornia crassipes*, and *Hydrilla verticillata*, have already been proved to be as Hg (II) and Cr (VI) accumulators. These plants can be utilized for removal of the heavy metal pollutants from the polluted water bodies without endangering the lives of other flora and fauna.

By considering the data it was concluded that, physico-chemical parameters and pollutions tolerant genera and some species of blue green algae confirmed in Salim Ali Lake that the presently lake is organically polluted. It is necessity to control the pollution of lake and lake is useful to citizens of Aurangabad.

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