

## ALGAL FLORA OF NAGDAHA LAKE, LALITPUR, NEPAL

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### ABSTRACT

This paper is a report of algal flora of Nagdaha Lake, Dhapakhel, Lalitpur. Algal Samples were collected out in the months of May, August and December 1996, from four different sampling sites of the lake. From the investigation, 25 different algal taxa belonging to 16 families were observed. Among them, 17 species were observed in summer and winter season while in rainy season 19 species were observed.

**Keywords:** Algae, families, seasonal variation, species

### INTRODUCTION

The algal flora of Nepal, by taxa, comprises of 687 species belonging to 150 genera and 50 families (Baral 1995). Algal flora are economically important in a number of ways like food value, extraction of minerals, green manure production, nitrogen fixation etc. In Nepal, algae have been recorded from tropical habitats of Terai to arctic habitats in the Himalayas up to 4850 m. The majority of algae are fresh water forms, only a few species are terrestrial and sub-aerial forms. The Terai and Siwalik belt are favorable for the growth of algae as these zones have hot and humid climate. The desmids, diatoms and blue green algae are the most recorded group of algae. Hirono (1995) suggests that higher attitudes will be rich in diatoms flora. The main objectives of the current research are (i) to enumerate the algal taxa of Nagdaha Lake and (ii) to study the seasonal fluctuation of algal taxa within the study site.

### MATERIALS AND METHODS

#### *Study Site*

The study was conducted at Nagdaha Lake, Dhapakhel, Lalitpur. The study site was selected based on catchment area, substrate structure, algal occurrence and human activities.

Nagdaha is a sacred lake. It lies about five km south from Patan city in Dhapakhel village on the way to Godavari. Water is received from annual monsoon rain, ground water seepage and a small stream inlet. The outlet of lake is on the eastern side. The lake is zigzag in shape. It occupies an area of about five hectares. The lake attains a maximum depth of seven meters. It is surrounded by agricultural land. The bank of the lake is being protected by bamboo mesh net to control soil erosion. Due to death and decay of macrophytes, and the dead macrophytes collected at the bottom of lake and agricultural soil run off during rainy reason, the lake is being shrunken and succession take place. Due to succession, wet land vegetation occurs in one corner of the lake.

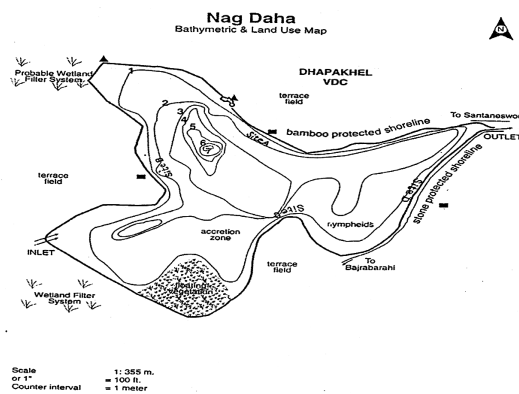


Fig. 1 Nagdaha Lake

Fig.1 Nagdaha Lake

### Data collection

The data were collected based on visual observations, field works, lab works and information collected from local people as primary source. Samples of algal were collected out in the months of May, August and December 1996. Algal samples were collected from four different sampling sites of the lake in proclaimed plastic bottles with the help of siphon sampler. The samples were collected from surface and up to depth of 3 meters. Two liter of water from each depth was filtered through the plankton net (mesh size 45.1) and it was transferred to plastic bottles. Then, the samples were preserved in the Lysol's solution (7m 1/1) and stored in a cool and dark place. For identification of algal taxa,

the standard keys provided by Prescott (1978), West and West (1978), Bishwas (1995) and APHA (1995) were followed.

## RESULT AND DISCUSSION

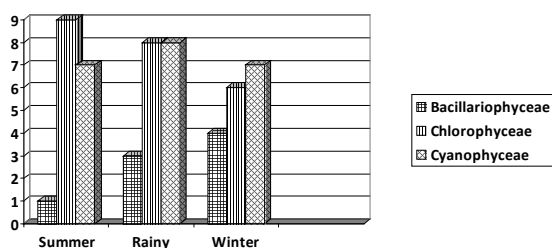
From the biological point of view, the present investigation revealed that different algae have inhabited Nagdaha Lake. Altogether, 25 algal taxa belonging to 16 different families have been observed. Maximum (76%) algal taxa were observed during rainy season. While minimum (60%) algal taxa were observed during summer and winter reason. The detail picture of data analysis of Nagdaha Lake is presented in fig. 2 and Table 1). Current result suggests the seasonal variation in algal diversity with high abundance in rainy season. This may imply that rainy season is the optimal season for the growth of algae. Consistent to this result, Hickel (1973) found seasonal variation of algal diversity from various lakes of Pokhara such as Phewa, Rupa, Begnas and Khaste and from Taudaha and Nagdaha of Kathmandu valley. Similar to the current result, Pradhan (1995) and Aryal (1995) have also studied the seasonal variation in algal diversity. Following their findings and the current finding, it is suggested that the degree of water pollution is one of the major factors that affect the diversity of algal growth.

Table 1 Algal taxa of Nagdaha Lake (1996)

Algal Taxa	Classes	Summer	Rainy	Winter
<i>Oscillatoria</i> species	Cynophyceae	-	+	+
<i>Anabaena</i> species	Cynophyceae	-	-	+
<i>Lyngbya</i> species	Cynophyceae	-	+	+
<i>Spiruliana</i> species	Cynophyceae	+	-	-
<i>Nostoc</i> species	Cynophyceae	-	+	+
<i>Chara</i> species	Chlorophyceae	+	+	+

<i>Chlorella</i> species	Chlorophyceae	+	-	-
<i>Oedogonium</i> species	Chlorophyceae	+	-	-
<i>Spirogyra</i> species	Chlorophyceae	+	+	+
<i>Zygnema</i> species	Chlorophyceae	+	+	-
<i>Stigoclonium</i> species	Chlorophyceae	-	+	-
<i>Cladophora</i> species	Chlorophyceae	+	-	-
<i>Cosmarium</i> species	Chlorophyceae	-	+	+
<i>Closteiu</i> species	Chlorophyceae	+	+	+
<i>Pediastrum</i> species	Chlorophyceae	+	+	-
<i>Antinotaneum</i> species	Chlorophyceae	-	+	+
<i>Scenedesmus</i> species	Chlorophyceae	+	-	+
<i>Flagillaria</i> species	Bacillaryophyceae	+	+	+
<i>Diatoma</i> species	Bacillaryophyceae	+	+	+
<i>Synedra</i> species	Bacillaryophyceae	+	+	+
<i>Navicula</i> species	Bacillaryophyceae	+	+	+
<i>Pinnularia</i> species	Bacillaryophyceae	+	+	+
<i>Stauroneis</i> species	Bacillaryophyceae	-	+	+
<i>Gomphonema</i> species	Bacillaryophyceae	+	+	+
<i>Nitzschia</i> species	Bacillaryophyceae	+	+	-
Total No. of species in different season		17	19	17

+ Present, - Absent



**Fig. 2** Seasonal variation of algal taxa in Nagdaha Lake

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