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Limnological Pre-survey of Lake Phewa, Nepal

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We investigated several lakes in central Nepal in 1976 from March to April, just before the summer monsoon. Few limnological studies have been made on these lake despite the presence of numerous Japanese technicians locally engaged in fishery cultivation. This note reports some limnological features of Lake Phewa which is silty and the largest lake among them. It is at an altitude of 795 m and has a maximum depth of about 20 m (Fig. 1).

Water samples were taken by the use of a Kitahara type water sampler (2 L) near the point of maximum depth. Water temperature was measured with a glass thermometer as samples taken from various depths. Transparency was determined by a Secchi disk. The concentrations of inorganic matter were measured directly by a water quality measurement kit (HACH Chemical Co. AMES, IOWA). Chlorophyll *a* was determined spectrophotometrically according to the standard method of UNESCO[1] for the samples of GF/C filters (Whatman Co.) after the filtration of lake water and storage in a desiccator for 2 weeks. The amount of seston was estimated from the difference in dry weight with GF/C filter drying at 110°C prior and after filtration of lake water. Productivity was determined by the *in situ* light and dark bottle oxygen method.

Figure 2 and Table 1 show the results of the present observations. No vertical changes were observed in water temperature and chlorophyll *a* content, but the dissolved oxygen content decreased significantly with depth. From the vertical profile of dissolved oxygen content and productivity, a decomposition layer seemed to have developed in the deeper layer. Also, a high respiration rate was observed at 0 m layer(Table2). It may be due to the abundance of allochthonous organic

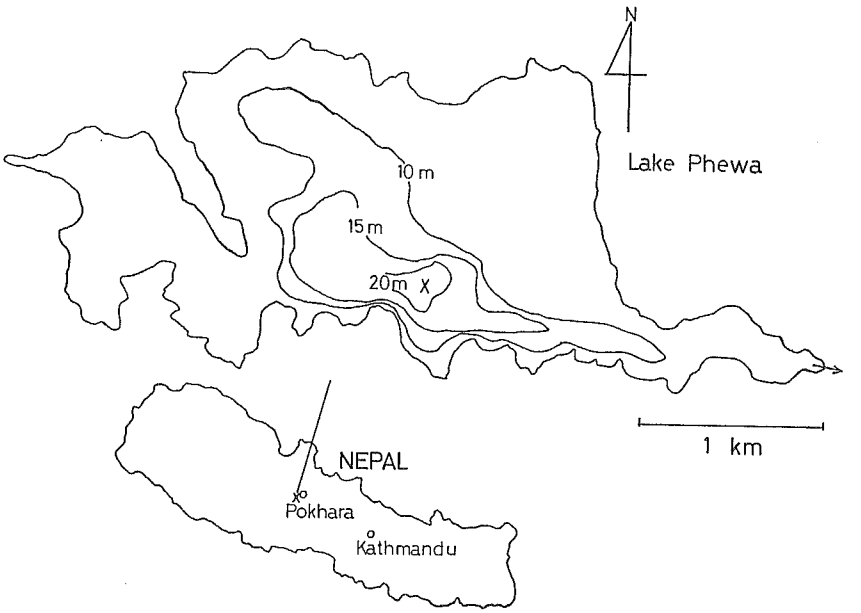

Fig. 1 Location and bathymetric map of Lake Phewa. The sampling station is shown by a cross mark.

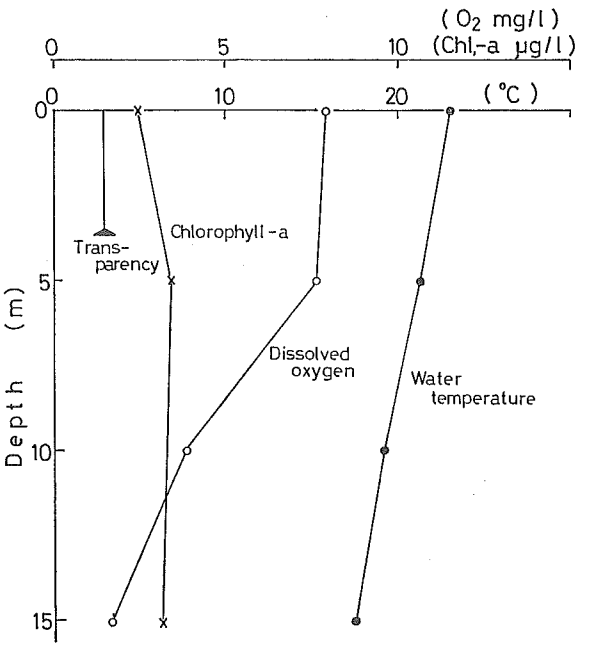

Fig. 2 Vertical distribution of water temperature (°C), dissolved oxygen (0_2 mg/l), and Chlorophyll *a* (μg/l).

Table 1 Chemical composition of surface water in Lake Phewa, on 28 March, 1976.

pH	Seston (mg/l)	Hardnes ($CaCO_3$mg/l)	PO_4-P (mg/l)	NO_2-N (mg/l)	NO_3-N (mg/l)	$Fe^{2+}+Fe^{3+}$ (mg/l)
8.3–8.9	16.2–17.0	22–25	0.02–0.06	0.002–0.005	0.15–0.25	0.06–0.14

Table 2 Net production and respiration

Depth (m)	Net production (mg O_2/l/day)	Respiration (mg O_2/l/dey)
0	0.31	0.90
15	−0.05	0.08

matter supply.

Lake Phewa may be considered to be a mesotrophic lake from the results of chemical environment and productivity in this investigation[2], but it must be noticed that the meteorological condition was drastically changed between the dry season and the summer monsoon[3]. Further study throughout the year would be necessary to clarify the limnological features of the lakes in Nepal, which has quite different climatic conditions from those of Japan.

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