Hydrobiology of Tapi Estuary, Surat

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Physico-chemical parameters and productivity were estimated in Tapi estuary during July 1979 to May 1980. Wide fluctuations were observed in all the parameters analysed. Plankton composition and their productivity were correlated to the other environmental parameters.

Hydrography of east and west coast of India along with studies on zooplankton and primary productivity, has been reported.

In Gujarat there are 2 estuaries, viz. Tapi and Narmada. Much work is not done on the hydrobiology of Tapi estuary, in Surat city (21° 12' N and 72° 50' E). With a view to obtaining data on physical, chemical and biological aspects of Tapi estuary, this study has been made.

Tapi river which originates at Multai, in Satpura Hills, flows along the northern border of the Surat city and opens into the Arabian Sea near Surat. It drains total catchment of about 64,000 km. The average rainfall in the catchment area is 775 mm. Collections were made between 0800-1000 hrs every fortnight during July 1979 to May 1980. Temperature of the surface water sample was taken in the field. Water samples were analysed for various components using

![Graph showing monthly changes in temperature, pH, salinity, silicate, calcium, bicarbonate and carbonate in Tapi estuary]

Fig. 1—Monthly changes in temperature, pH, salinity, silicate, calcium, bicarbonate and carbonate in Tapi estuary
standard methods. Rainfall data were obtained from Havaman kacheri at Rander (Surat). Productivity was estimated by colorimetry and expressed as optical density of the pigment extract (blue filter used). Phytoplankton counts were taken using a haemocytometer. Plankton were collected in silk bolting cloth (with 20 mesh size) and identified up to species level.

The plankton comprised the following:


Zooplankton-Protozoas: *Euglena* sp., *Paramecium* sp., *Verticella* sp., and Arthropods: *Cyclops* sp., *Daphnia* sp., *Palemon* sp., and *Scylla serrata*. Larval forms were not identified.

Variations in different physico-chemical parameters and productivity in Tapi estuary during the study period are shown in Figs 1 and 2.

Water temperature was high during May when other parameters like salinity, dissolved oxygen, *p*H and Ca were also high. During this period the nutrient concentrations were low, but the plankton population was fairly normal. Among the plankton, diatom population was high, as evident from high silicate values.

Considerable variation was found in salinity in Tapi estuary. However with increasing salinity, there is an increase in plankton population. Decrease in salinity may be due to monsoon runoff/Ukai dam water.

When the productivity was more, no significant changes were found in other parameters. When factors like salinity, *p*H, dissolved oxygen, nutrients were least, the productivity was also less and only blue-green algae and some larval forms were present during this period. The present results agree with those of Shetty *et al.*14, who observed that the production and composition of plankton are governed by several hydrobiological features.

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