

## NON-TOXIC BLOOM OF *ASTERIONELLA JAPONICA* ON CLIFTON BEACH IN KARACHI

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The occurrence of a dense phytoplankton bloom of diatom *Asterionella japonica* Cleve *et* Möller causing red colour was observed during high tide in surface water of Clifton beach near Gizri Creek in the morning of 20th August 1984 in front of National Institute of Oceanography Laboratories. The bloom spread over an area of 7 x 3 km and persisted for about a week (Fig. 1). The surface water of the area appeared brownish and formed a foam or scum due to very dense growth of *A. japonica*, approximately 99% of the biomass. Patches of brown foam were washed ashore by the surf caused due to wave action so that the whole area along the Clifton beach was densely covered by brownish material during low tide.

Due to heavy rain of 277 mm from 4-6 August 1984, Malir River was flooded and a breach in the dam caused flood in the low lying area of city of Karachi viz., Defence Society, Korangi, Mahmoodabad, Akhtar Colony and Korangi Industrial areas. When flood water receded into Arabian sea via Gizri Creek it might have become nutritionally very rich, which favoured growth of *A. japonica*. During the same period other areas around Karachi like Hawkes Bay and Cape Monze in the West and Creeks adjoining Port Qasim in the South East Karachi did not show the occurrence of red tide. Iron rich water carried out to sea by rivers is known to promote intense blooms of red tide forming organisms (Steidinger & Joyce, 1973). Diatom blooms have also been recorded in various parts of the world at the end of rainy season due to fresh water inflow into inshore areas (Sournia & Plessis, 1974).

No change in sea surface temperature was observed. Low salinity of 29.5% as compared to 36.8% coupled with nutrient rich water might have favoured the initiation, growth and persistence of *A. japonica*. Blooms are initiated by benthic cysts, (Steidinger, 1975) and almost all neritic and estuarine bloom species produce resting cysts (Steidinger & Haddad, 1981). It is implicated that the resting cysts of *A. japonica* were triggered to produce monospecific bloom in this area supported by other factors. At times of outbreaks of red tides cysts are distributed into the upper layers and utilise the nutrients both at the lower levels (Cassie, 1981).

Persistent blooms of diatoms belonging to the genera *Anaulus*, *Asterionella*, *Aulacodiscus*, and *Chaetoceros* restricted to surf zones have been recorded in many parts of

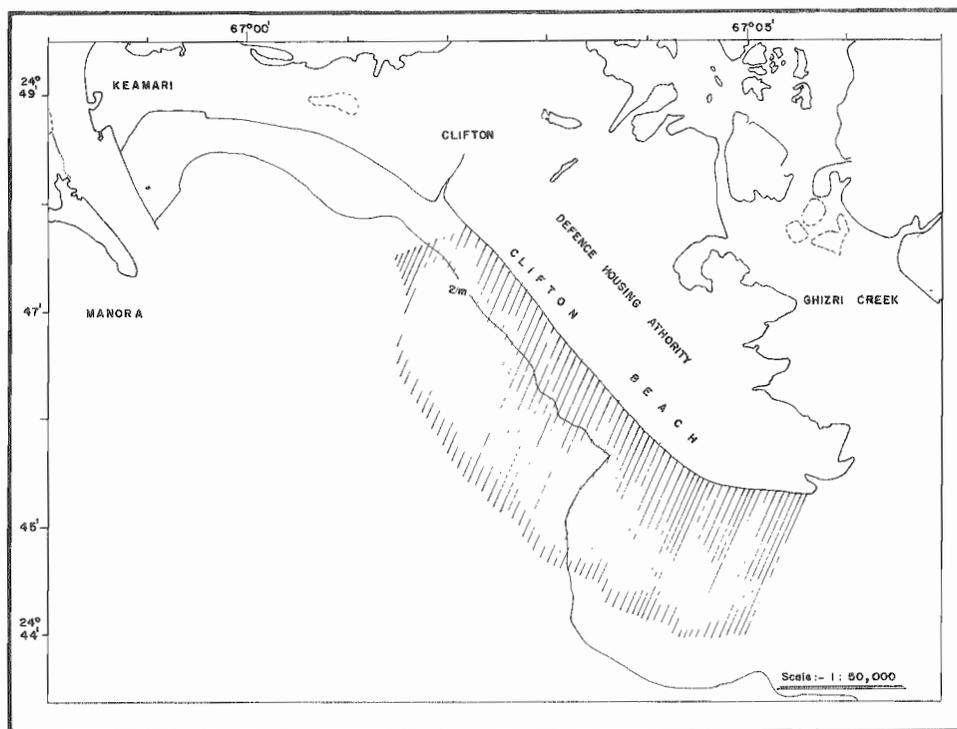


Fig. 1. Hatched section showing bloom area of *Asterionella japonica*.

the world (McLachlan & Lewin, 1981). Biological and ecological aspects of *A. socialis* have been discussed (Lewin & Noris, 1970); but no report has so far been made about *A. japonica*. A very dense and large patch of *Noctiluca* bloom forming red tide has been noticed during monsoon season of May, 1977 while on board R/V Fridtjof Nansen off Indus Delta (Khan, S.H. unpublished). The bloom of *A. japonica* was non-toxic as no mortality was recorded from the area after bloom. Instead, by the end of September 1984 a dense population of jelly fishes was observed in the same area of Clifton beach, which varied in size from small to large. It shows that an interesting food chain might have been set up due to this localised, distinct, monospecific bloom.

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