

Mass envenomation during Ganesh idol immersion at Girgaum-Chowpathy beach, Mumbai, Maharashtra

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At the end of South-West monsoon along Mumbai coast a swarm of the box jelly fish, *Chiropsoides buitendijki* was observed during Ganesh idol immersion at Girgaum-Chowpathy beach, Mumbai on 10th September, 2013. The occurrence of such large number of jelly fishes coincided with Ganesh idol immersion, perhaps for the first time in Mumbai waters. Several devotees of Ganesh who congregated at Girgaum-Chowpathy beach for immersion ritual of Ganesh idol were stung by the jelly fish. According to the news paper reports, the devotees moved with the idol in ankle-deep water for immersion and immediately thin tentacle-like threads pierced legs and ankles causing severe burning sensation. When the victims reached the beach, swelling, blister, bruises and severe pain was reported and about 60-75 victims were hospitalized for the treatment. At the same time many people had sting bite of Whiptail ray, *Himantura imbricata*. The local news papers and TV channels broadcast the news that sting ray and eel were the causative agents for the incidence.

Knowing the expertise of CMFRI, Commissioner of Maharashtra State Fisheries Department contacted Scientist-in-Charge of Mumbai Research Centre to conduct a survey of the beach and near shore waters. On 11-9-2013 CMFRI scientists and technical staff carried out expeditious survey of the beach and near shore waters in early morning hours by shore seines (drag net or *yendi* net and *pera* jal in Marathi) and fishing nets. The survey revealed presence of stings rays, box jelly fish, flat head, spotted scat and eels in shallow water at the beach (Fig. 1). The honourable Chief Minister Prithviraj Chavan called the CMFRI team to appraise about the organisms that caused the panic and hospitalization of the victims. He showed keen interest in the causative organisms and instructed the team to carry out onshore and near-shore

surveys on 13-09-2013 and 18-9-2013 (5th and 10th day of Lord Ganesh immersion) to give pre-immersion alert and warnings.

On 13th and 18th September 2013, surveys were carried out by 3 teams between 0700 and 1200 hrs. One team visited Girgaon Chowpatty and the other Juhu-Versova beach. The first team carried out 3 onshore surveys using beach seine operation of fishing nets in 0.5-1.5 m depth at Girgaon Chowpatty. Second team combed the beach from Juhu to Versova and observed many indigenous fishing boats and trawlers fishing very close to the beach in 1-5 m depth. The fish nets showed presence of edible fish and prawns in the near shore waters. But, presence of banana prawn *Penaeus merguensis* in large congregation in shallow depths was conspicuous for which about 50-70 indigenous boats carried out fishing. There were no dangerous jelly fish and sting rays in the water on either day. Third team carried out boat survey in the sea 1.5 km away from the coastline from Versova to Cuffe Parade. Three trawling operations were carried out by M.F.V. Narmada (fishing vessel of Central Institute of Fisheries Education) between 0800 to 1200 hrs at

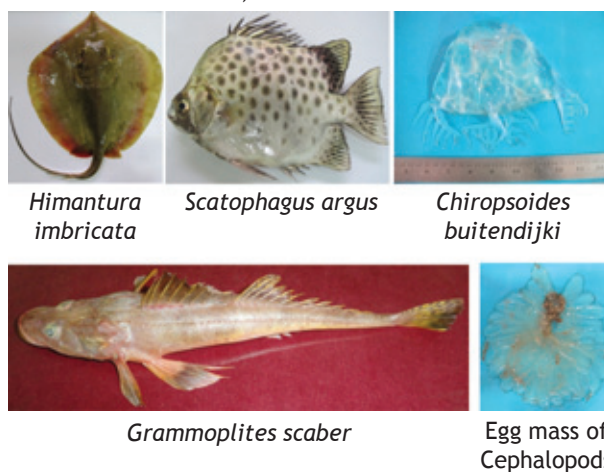


Fig. 1. The specimens collected during survey of Girgaum-Chowpathy beach, Mumbai

Verova-Juhu, Dadar-Worli and off Malabar hill and Cuffe Parade. The fishing surveys showed usual fishes such as sole, anchovy, cat fish, prawns and Bombay duck; no potentially dangerous organisms were noticed in trawl catch in the near shore waters on either day. Neither jelly fish nor sting ray was noticed in the fishing operations and beach survey.

However, on 18-9-2013 the beach surveys at Girgaon Chowpatty showed presence of 12 sting ray babies in 1-1.5 m depth from 3 beach seine operations. Assuming uniform distribution of sting rays, it was estimated that there were nearly 6,000 sting ray juveniles in the entire Girgaon Chowpatty bay area of 3.1 Sq km. Their sting is potentially dangerous to the devotees entering the sea, therefore based on CMFRI report the Municipal Commissioner gave warning to the public and devotees against the sting ray bites even in knee deep water during entire immersion event.

The sting ray was identified as *Himantura imbricata* and eel as *Gymnothorax* sp. All the sting rays were new borns young ones in the size range 75-140 mm in disc diameter and possibly they entered the bay area for feeding on intertidal molluscs. But presence of such large number of juveniles of the demersal fishes in shallow waters may be related to oxygen minimum layer that to the shore surfaces along Maharashtra coast by September, the anoxic layer rising pushed them to nearshore waters and topographic currents aggregated them in the bay. Despite being juveniles and new born babies, the stings of the rays were powerful enough to cause severe pain and wounds.

The box jelly fish was identified as *Chiropsoides buitendijki*. Although it is not highly dangerous like *Chironex fleckeri* which is deadly and cardio-toxic, it has nematocysts on the tentacles which produce neuro-toxin. This neuro-toxin caused severe itching and burning sensation and the victims were treated with lime and anti-histamine injections. On 10th September the atmospheric temperature was very high and possibly the surface sea water temperature also increased, as a result the jelly fishes gathered in the bay area. However, rainfall and sudden cooling of sea water induced scattering of jelly fishes all around in shallow water bay which caused panic among the devotees.

Marine fishes *Himantura imbricata*, *Grammoplites scaber*, *Scatophagus argus* are demersal fishes move away for disturbances in the water and rarely attack the human beings or predators in self-defense. The mass envenomation to the devotees cannot be caused by these fishes and may not be the reason for hospitalization of the victims. During analysis of samples, it was found that the box jelly fish, *Chiropsoides buitendijki* and *Himantura imbricata* were the species that caused mass envenomation to the public during Ganesh idol immersion. While the box jelly fish was examined in the laboratory for the identification, accidentally its tentacles touched on the right thumb of first author and immediately the microscopic nematocyst adhered to the skin and venom was injected to the local area of thumb and is got swelling. The sudden swelling of the thumb followed warm sensation at the swollen area, strained eyes and slight giddiness. The box jelly fish sting was treated with fresh lime and seawater to remove the unfired nematocysts to avoid further worsening of the sting. This incident led to declare that mass envenomation was caused by the box jelly fish, *Chiropsoides buitendijki* only, but the not other species collected during the survey.

The Scaly whiptail ray, *Himantura imbricata* often buries in sandy and muddy bottom and remains motionless until disturbed. The sting ray twists the tail upward and forward, driving the spine into victim's body when disturbed. As the sting enters the flesh, integumentary sheath of the spine is ruptured and venom comes into contact with the victim's tissues.

The physico-chemical parameters were also collected during the survey of Girgaum-Chowpathy beach, Mumbai presented in Table 1.

Table 1. Physico-chemical parameters of Girgaum-Chowpathy beach, Mumbai on 11th September, 2013.

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|-------------------------|------------|
| Atmospheric Temperature | 28°C |
| Water Temperature | 27.7° C |
| pH | 7.8 |
| Salinity | 32.6 ppt |
| Conductivity | 49.7 mS/cm |
| DO | 3.82 mg/l |
| TDS | 34.43 ppm |
| Turbidity | 42.3 NTU |