

Alenka MALEJ

Marine Biological Station Piran  
Institute of Biology, University of LJUBLJANA (Slovenia)

In the waters of the shallow Northern Adriatic, algal blooms and discoloured waters are not exceptional since it has an enhanced terrigenous input of organic and inorganic nutrients, and essential metals. During the summers of 1988 and 1989, sticky whitish yellow slime accumulations, up to 15 centimeters thick and several kilometers long, concentrated along the western and to a lesser extent eastern coasts of the Northern Adriatic. The phenomenon was repeated during August 1991.

The first public report of similar gelatinous (mucus or slime) accumulations in the Northern Adriatic dates back to 1729 and detailed descriptions exist for the outbreaks in 1872, 1891, and several others in the 20th century. Marine scientists have long been puzzled by this phenomenon and it is still poorly understood. Microscopic examination of the collected material showed that generally the mucus contained different planktonic and sometimes benthic organisms. Various species of pelagic diatoms, from time to time dinoflagellates and benthic diatoms, were most frequently recorded, as well as numerous cyanobacteria.

In view of the dominant organisms found within the mucus, some authors suggest that mucus is produced by phytoplankton, though others cast doubt on its pelagic origin, implying that it is derived from benthos. Data and field observations of mucus structure, behaviour and the organisms involved have accumulated, and several authors tried to explain the mechanism of the phenomenon by analysing the biochemical composition of mucus, surveying aggregates for organisms, and determining environmental factors before and during the outbreaks, but none convincingly.

In 1990, a research programme aiming at elucidating the origin, development, and consequences of gelatinous aggregates in the Northern Adriatic was launched by the Observatory of the Northern Adriatic, Trieste, with participation of five laboratories from Austria, Croatia, Italy (regions Friuli-Venezia Giulia and Veneto) and Slovenia. A field programme in the Northern Adriatic including the Gulf of Trieste and the Kvarner region followed the development of water column stratification, inorganic and organic nutrient dynamics, seasonal changes in suspended matter, microbial plankton, phytoplankton, microzooplankton and net zooplankton, sedimentation rates, microphytobenthos, meiobenthos and macrobenthos. The *in situ* distribution, development and transformations of macroaggregates were surveyed by SCUBA divers and different types of aggregates analyzed biochemically and under the microscope.

Of the two years studied, the summer of 1990 was characterized by modest development of macroaggregates in the form of stringers up to a few centimeters long, little flakes and loose masses in the form of small clouds or veils, but without larger accumulations on the surface. The distribution of macroaggregates within the water column was related to the stratification. During 1991, besides the forms observed in 1990, larger and more compact rounded structures were observed in the water column in July, and initially transparent strands on the surface amassed into sticky slime accumulations along the northern Adriatic coasts during August.

In this communication a preliminary analysis of some data deriving from the northern Adriatic Observatory Programme is given, and the importance of different pelagic processes for macroaggregate development and slime accumulations is discussed.