

## Nematofauna in North Adriatic offshore sediments

Ana TRAVIZI

"Ruder Boskovic" Institute, Center for Marine Research, ROVINJ (Croatia)

In the Adriatic offshore sediments, the free-living nematofauna assemblages remained scarcely known until now, and their structural compositions were not studied comparatively.

To overcome the gap, in September and October 1991 the nematofauna had been sampled at six offshore stations characterized by silty-sand (stations SJ-005, 007, 107), and by silty clay or clayed-silt sediment, enriched by sandy fractions (station SJ-101, 103, 108) (Fig.1). According to TIETJEN (1977), sediments composed by different ratio of silt and clay components (64-75%), were classed as mud. The sediment was sampled by SCUBA divers by means of plastic hand corers, 3.5 cm inner diameter. Three replicate per station were taken, and processed according to standard methods (VIDAKOVIC, 1987). For taxonomic purposes, 200 specimens per station were studied.

In muddy sediments, 15 free-living species were noted at each station. At stations characterized by silty-sand 30-36 species were identified. The QS at muddy group of station varied from 67 to 73 %, and at silty-sand from 59-70 %, respectively. Between the stations of different sediment types, the similarity calculated was only 31-54 %.

At all stations, a significant dominance of few species were noted. At muddy stations, 7 species (abundance > 5 %) share by 20-33 % in species composition, and 78-87 % in nematofauna density. At silty-sand group of stations, in total 14 abundant species were identified, but their dominance was less expressive, and they were more evenly distributed among the codominant species. A joint mark of nematofauna assemblages at particular sediment type, i.e. mud or sand, was an expressive dominance of only three species at silt-clay bottoms, and a relatively high abundance of eight species at silty sand bottoms. In general, our results are in accordance with conclusions of TIETJEN (1977), and notes of VIDAKOVIC (pers.com.) on nematofauna composition species at similar types of sediment in coastal areas.

At muddy stations, an expressive dominance of non-selective deposit-feeders (1B) was established. This group prevailed at silty-sand stations too, except at station SJ-007, at which a dominance of epigrowth-feeders (2A) was noted. In silty-sand sediment, however, a relatively high share of omnivorous and predatory (2B) species was found out.

Consequently, because of low participation of 2A category at silty-sand stations SJ-005 and 107, the predominance of 2B species over them, and some peculiar features of meiofauna and nematofauna species compositions, it seems that, besides the sediment granulometry, the eutrophication conditions involving in the area in past decade, also could play a decisive role in determining the nematodes assemblages compositions.

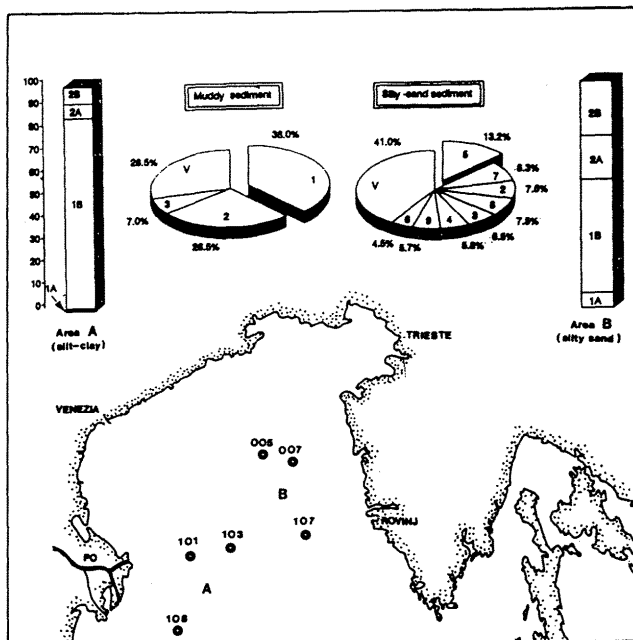


Fig. 1. Nematofauna composition. Species 1- *Dorylaimopsis mediterranea*, 2- *Sabatieria proabyssalis*, 3- *Actarjania* sp., 4- *Rhabdodemania mediterranea*, 5- *Pomponema multipapillatum*, 6- *Halichoanilaimus dolichurus*, 7- *Hopperia* sp., 8- *Axonolaimus* sp. 9- *Sphaerolaimus dispar*, V- other species (abundance < 5%).

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## The Strunjan Nature Reserve - Main features and role

Robert TURK and Boris KRIZAN

Intercommunal Institute for Natural and Cultural Heritage Protection, PIRAN (Slovenija)

The Gulf of Trieste is a shallow marine ecosystem where characteristics of the coastal and open waters of the Northern Adriatic are combined. With few exceptions the depth of the gulf does not exceed 25 m. Because of its shallowness and the freshwater inputs as well, the waters of the Gulf experience considerable temperature and salinity variations. The tides, compared to the modest tidal amplitudes in the rest of the Mediterranean Sea, can be considered remarkable (OLIVOTTI *et al.*, 1986). All this features make out of the gulf of Trieste a quite unique ecosystem. Unfortunately there is another characteristic, a gained one, that is threatening the uniqueness of the northernmost part of the Adriatic. Namely the intensive urbanization of its coastline and in consequence a serious degradation of the coastal ecosystems. The same goes of course for the 46 km of the Slovenian coast which is built-up mainly of flysch (shaped as high cliffs), of alluvial or sea sediments and as an exception of limestone. There are less than eight kilometers of natural coastline (SVETLICIC & KRIZAN, 1985), accidentally left aside by the onslaughts of urbanization. Half of it is represented by small parts of seashore randomly distributed from Debeli rtič to Savudrija and there is only one major part of natural coastline left between the town of Izola and Piran.

As it is difficult in such circumstances to ensure the protection of the marine environment, though it relies upon a whole series of legal instruments, underwater reserves and other protected areas act as a kind of safety barrier, maintaining or restoring the quality of that environment in areas that are particularly sensitive or of outstanding interest. There are three marine protected areas on the Slovenian coast. Two smaller ones - the underwater natural monument around Madona promontory in Piran and the natural monument Debeli rtič and the largest one - the Strunjan Nature Reserve, promulgated in January 1990.

The Strunjan Nature Reserve is a coastal and marine reserve. It covers the Northern part of the Strunjan Peninsula together with its 3.800 m long coastline and a 200 m wide sea belt. The steep flysch cliffs can be as much as 80 m high and are the highest flysch cliffs on the East Adriatic coast. There is a great variety of different geological and geomorphological features due mostly to the flysch structure and the inclination of layers (folded strata, microtectonical faults) but also to the different forms of erosion (calcareous sinter, cliff-foot caves, boulders) the latter being enhanced by the Northern exposure of the coast. The vegetation of the area is typically submediterranean and is represented mostly by a dense *Sesuvium - autumnalis ostryetum*. Very frequent also the *Arundo donax* and the spanish broom (*Spartium junceum*). Of great botanical interest the steep cliff edge above the Ronek promontory where representative of the evergreen eumediterranean vegetation are thriving amidst the deciduous submediterranean one. For two species, namely *Mirtus communis* and *Arbutus unedo*, common in the mediterranean maquis, the promontory represents probably the only autochthonous growing place in Slovenia (WRABER, 1972).

The sea bottom is rocky at first and silted later. The results of a preliminary inventory and topography of marine flora and fauna that was carried out in 1991 (VUKOVIC *et al.*) are showing a great diversity of marine organisms that are representing a mixture of mediterranean and boreal species. The fact is enhanced also by the absence of direct pollution of the area and as a result by the more or less natural ecological processes on both sides of the coastal line. To point out the Moon Bay, because of its *Cymodocea* and *Zostera* prairie with single subjects of *Pinna nobilis* and *Spirographis spallanzanii* and the Ronek promontory with its dense and diversified algal vegetation (TURK, 1991).

In order to protect the area from excessive and harmful disturbances the promulgation decree among other prohibits to : dump rubbish of all kinds, intervene so to cause degradation of the living conditions for plants and animals on land and in the sea, gather, uproot or destroy plants, pick up seeds and fruits, collect sea organisms and to fish with the exception of angling, hunt or collect animals, enter non-autochthonous plants or animals, destroy or damage nests and other living spaces, cause noise, explosions and vibrations, make a fire and navigate and anchor in the area between the promontories of Strunjan and Ronek from the 15<sup>th</sup> of June to the 15<sup>th</sup> of September.

As it was mentioned above, marine and coastal reserves so as other protected areas represent an important tool in the struggle for a sustainable use of natural resources. The intensive urbanization of the coastline of the Gulf of Trieste calls for a whole network of protected areas in order to stop and reverse the degradation of single marine and coastal ecosystems and of the gulf as a whole. The Strunjan Nature Reserve, being the largest marine reserve in the gulf could be an important link in this network.

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