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MARENZELLERIA VIRIDIS (VERRILL) (POLYCHAETA, SPIONIDAE) — A NEW SPECIES FOR THE GULF OF RIGA

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MARENZELLERIA VIRIDIS (VERRILL) (POLYCHAETA, SPIONIDAE) — UUS POLÜHEET LIIVI LAHEST. Gunars LAGZDINS, Parsla PALLO

MARENZELLERIA VIRIDIS (VERRILL) (POLYCHAETA, SPIONIDAE) — НОВЫЙ ВИД В РИЖСКОМ ЗАЛИВЕ. Гунарс ЛАГЗДИНС, Парсла ПАЛЛО

Abstract. A new polychaete species was found in the coastal area of the Gulf of Riga in 1988. It was identified as *Marenzelleria viridis* (Verrill, 1873) by dr. Doris Shiedek (Institute für Ostseeforschung, Warnemünde). During 4 years its abundance increased up to 1380 ind./m². Up to 1988 there was found 5 species of Polychaeta living in the Gulf of Riga — *Nereis diversicolor*, *Harmothoë sarsi*, *Pygospio elegans*, *Manayunkia aestuarina*, and *Fabricia sabella*. *M. viridis* occupies sandy and silty sandy sediments in areas with bottom water salinity up to 5.85‰. There would be a competition between the former leading *P. elegans*.

Key words: Gulf of Riga, Polychaeta, *Marenzelleria viridis*.

Since 1983 the worm had been reported from the North Sea coasts of England and Germany. In 1984 *M. viridis* was found nearshore area of the Southern Baltic, and in 1988 in the coastal region of the Polish part of the Southern Baltic.

Such a fast distribution does not seam to be a natural spreading rate for the sedentary worm of the pelagic larvae. There is a greater probability that the worm has been brought in by ships.

MATERIAL AND METHODS

The sampling of sediments was done by a modified bottom grab of Van-Veen, with biting area 0.05 m^2. The sieving of sediments was done through a kapron net with the mesh size up to 0.5 mm. The residue of sediments with organisms was preserved in 4% solution of formalin in sea water. Sorting and picking up of organisms was done under stereomicroscope. Organisms were counted and weighed in wet formalin. The number of individuals and their weight was calculated in 1 m^2.

AREA OF RESEARCH

The Gulf of Riga is the third largest bay of the Baltic Sea. Its area is 16 330 km^2. The drainage area is here 8 times higher (Пастерс, 1967). The coastal line of the Gulf is straight, without bays, and the nearshore bottom and coasts are mostly made up of sands. Only in some places there are rocks on the beach and in the nearshore area. The main depth of the Gulf is 26 m. Salinity of bottom layers varied from 3 to 7‰ (Ботва et al., 1987).

RESULTS

The first finding of a new polychaete happened on June 4, 1988, near the mouth of Daugava. In 1989 we found it in 3 places in the region of a sea resort town Jurmala at the depths of 5—10 m. In all cases there was only one specimen per sample. Salinity in this area varies from 5.04 to 5.15‰, oxygen — 7.68 to 7.76 ml/l and BOD_5 — 0.38 to 0.95 mg/l (Filmanovich, pers, comm.). In 1990 *M. viridis* were found in 8 samples in the southern part of the Gulf (Tab. 1, 2).

One can see significant increase of the number of the worms. Transection of Daugava is not far from the sea channel of the Riga port. In 1990 there were findings of *M. viridis* in the nearshore region of Ventspils, but there were only a few specimens in the samples.

In 1991 there were findings of *M. viridis* all around the Gulf of Riga at the coastal zone of the Gulf at the depths 5—30 m in no bigger numbers than 340 ind./m^2. In the western part of the Gulf it was distributed to the depth of 30 m. Between Lielupe and Daugava river mouths, near the out-fall of the treated sewage of the Riga Sewage Treating Plant, were found slightly higher figures of abundance — 20—600 ind./m^2. The depths of the stations were 10—20 m. The type of the sediments deeper than 15 m was silty sand in shallower waters there were sands with middle coarse detritus.

In 1992 in the region between Lielupe and Daugava in summer (June) there was at least twice higher abundance than in the previous year and the maximum number reached 1380 ind./m^2. The length of the worms was 100 mm, and it had at least 210 segments. In 1992 we found the worm in the area of Liepaja port. There were more polluted sediments there than in the other investigated parts. The specimens of the worm occurred in the sediments with a content of oil and H_2S. At these stations the number of *M. viridis* was twice lower than that of stations with sands and silty sands.

Table 1

***Marenzelleria viridis* in the southern part of the Gulf of Riga in 1990**

Data	Positions		Depth, m	Station	Number, ind./m²	Biomass, g/m²
	°N	°E				
June 25	5704.1	2401	7	Daugava	200	0.938
June 25	5704	2400	15	Daugava	840	1.186
June 25	5706	2359	22	Daugava	40	1.068
June 30	5701.1	2355.4	6	Lielupe	220	0.282
July 1	5702.3	2359.4	7	Bulli	80	0.184
July 1	5703	2357.4	17	Bulli	220	0.142
July 2	5705.1	2406.2	7	Vecaki	220	0.312
July 2	5705.4	2405.5	15	Vecaki	1040	1.778

Table 2

Some chemical data of stations with *Marenzelleria viridis* in 1991 (Filmanovich pers. comm.)

Date	Station	S, ‰	O_2, ml/l	BOD_5, mg/l
August 1	east	5.11	4.93	1.47
	south	5.22	4.97	1.41
	west	5.51	5.19	1.39
	north	5.22	3.8	1.74
October 14	east	5.00	2.26	0.98
	centre	5.18	1.98	1.12
	south	4.9	1.91	0.03
	north	5.46	1.61	0.13
	east	5.46	1.61	0.13
	centre	5.00	2.26	0.98
December 17	centre	5.29	8.51	1.09
	south	5.31	8.4	1.63
	centre	5.48	8.15	0.75
	west	5.35	7.72	0.78
	north	5.37	8.23	1.27

DISCUSSIONS

M. viridis first was reported in Forth- and Tay estuaries (Atkins et al., 1987) and from Ems, Elbe and Weser mouths (Essing & Kleef, 1988). In 1985, the worm was recorded in Darss — Zingster Boddenkette as the first in the region of the Baltic Sea (Bick & Burckhardt, 1989). In 1988, P. Gruszka reported the finding of *M. viridis* in the nearshore region of the Southern Baltic in the Pomeranian Bay. In 1988, the specimen was found in the south-eastern part of the Baltic Sea and nearshore region of Lithuania (Churbanova & Olenin, 1992).

The greatest worms were recorded by George (1966), having 250 segments and a body length of up to 140 mm. Maciolek (1984) found in North America individuals with 200 segments and 50 mm in length. In Ems Estuary there were worms with maximal length 100 mm (Essing & Kleef, 1988). In the Baltic near Darss — Zingst there were found worms with 120 segments and 27 mm in length (Bick & Burckhardt, 1989). Dimensions of the worm in Riga Gulf reach 100 mm in length, more than 260 segments, with a width at the 7—10 segments up to 2.5 mm.

There were some quantitative data given by the authors cited before — in Barther Bodden maximal density reaches 740 ind./m², but in Ems Estuary it became the main component of the bottom fauna, reaching 19300 ind./m². Gruzska reported maximal density up to 506 ind./m².

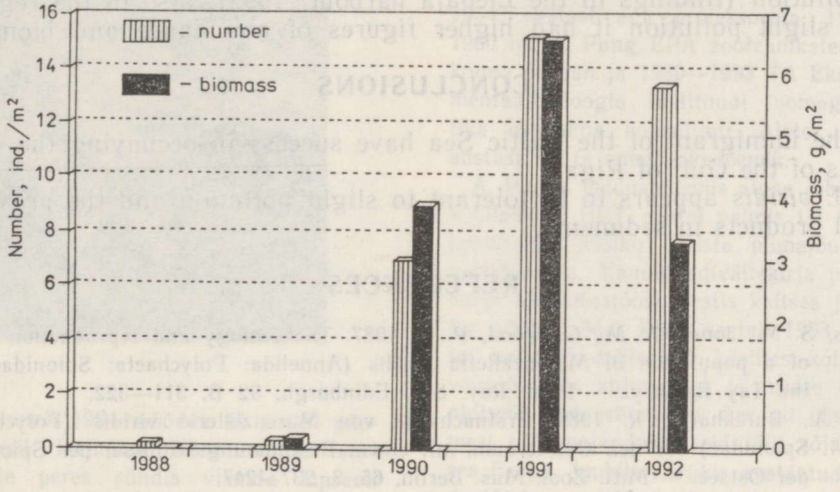

Fig. 1. Number and biomass of *M. viridis* in the southern part of the Gulf of Riga.

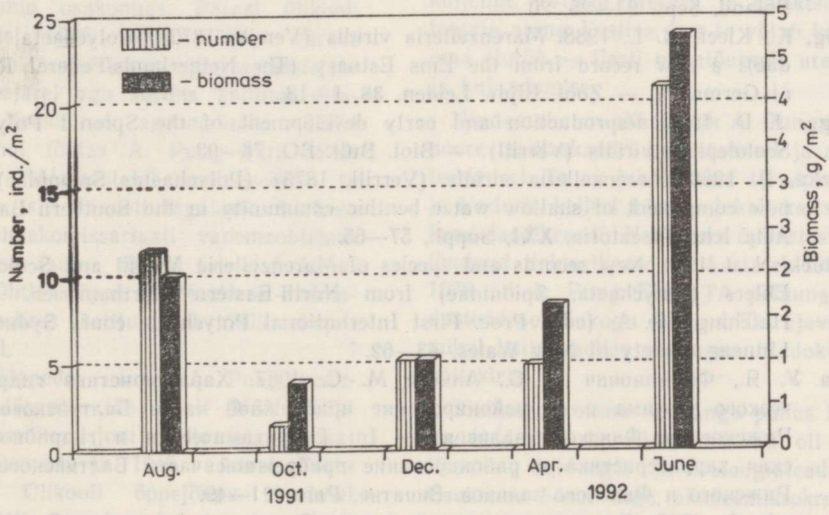

Fig. 2. Number and biomass of *M. viridis* near the out-fall of waste.

In the sediments of the Riga Gulf there was an increased density of *M. viridis* during 4 years — from 10 to 1380 ind./m², making up to 40% of the total number of bottom invertebrates. *M. viridis* preferred sands or silty sands. The depth ranged from 5 to 36 m. The *M. viridis* appears to be a soft and gentle organisms and during sieving processes they were broken and we could not get any whole individuals. The main feature of the newcomer up to now was the fact that *M. viridis* lives in biotopes together with 1—3 other species of Polychaeta: *Nereis diversicolor*, *Manayunkia aestuarina* and *Pygospio elegans*. A competition between the immigrants and "aborigines" was noted. Just now we had no opinions on the result of this competition. The development of *M. viridis* seems to be successful at least for the first 4 years of living here (Figs. 1, 2). Looking at Fig. 2, we should keep in mind that in the middle of September the treating of a part of wastes of the Riga city had started. Looking at the results, we have now came to the conclusion that on the coasts of Latvia *M. viridis* appears to be resistant to pollution (findings in the Liepaja harbour, 1992), also in the regions with slight pollution it had higher figures of abundance and biomass.

CONCLUSIONS

The immigrant of the Baltic Sea have success in occupying the sediments of the Gulf of Riga.

M. viridis appears to be tolerant to slight pollution and the presence of oil products in sediments.

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