Effect of induced anoxia on nematode densities, vertical distribution patterns and recovery at the Gulf of Trieste (Northern Adriatic Sea)

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Oxygen stress, including hypoxia and anoxia, is increasing worldwide due to natural and anthropogenic impacts and has serious consequences for benthic ecosystem functioning (Chan *et al.*, 2008; Diaz and Rosenberg, 2008).

Response and recovery of nematode communities to induced anoxia were investigated at the Gulf of Trieste, Northern Adriatic Sea. Anoxia was induced for 7 days, 1 and 10 months in benthic chambers installed at 24m depth in silty sand sediment using the Experimental Anoxia Generating Unit (EAGU, see Riedel *et al.*, 2012). At each time, three cores (i.d. 4.6cm) were collected in both experimental treatments and control situations. Cores were sliced into 7 depth layers: 0-0.5; 0.5-1; 1-1.5; 1.5-2; 2-3; 3-4 and 4-5cm, stored in 4% formaldehyde and after extraction, nematodes were counted in each layer.

Total nematode density, and the vertical distribution in the upper 2cm (0.5cm interval) and up to 5cm (1cm interval) were not significantly affected by anoxia after 7 days. In contrast, total density was clearly reduced after one month anoxia, and vertical distribution patterns were altered. Our results further indicate that recovery of nematode densities was not fully achieved after a recovery period of 10 months.

Our results indicate that nematodes were tolerant to short term anoxia (7 days). This may relate to adaptation mechanisms of nematodes to live in naturally low oxygen environments. On the other hand the negative effect on nematode communities after one month of anoxia can be related to increasing concentration of hydrogen sulphide (Riedel *et al.*, 2012) which can increase the negative effects of anoxia. It seems that complete recovery of nematodes density requires a relatively long period of time. This can be due to persistent unfavourable conditions in the sediment, or auto-ecological features including nematode reproduction capacity. However, more detailed (but ongoing) analyses are needed to increase our understanding of the effect on anoxia on nematode communities (e.g. at species level).

References

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