Stimulation of microbial nitrogen cycling in aquatic ecosystems by benthic macrofauna: Mechanisms and environmental implications

Peter Stief[1,2]

[1]Max Planck Institute for Marine Microbiology, Microsensor Group, Bremen, Germany

[2]University of Southern Denmark, Department of Biology, NordCEE, Odense, Denmark

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Correspondence:

University of Southern Denmark, Department of Biology, NordCEE, Campusvej 55, 5230 Odense M, Denmark; Phone: +45 6550 7980, E-mail: peterstief@biology.sdu.dk

Table S1: Macrofauna-induced stimulation of benthic nitrification and denitrification and of ammonium and nitrate fluxes across the sediment-water interface: Effect of data normalization on stimulation factors and flux enhancement values

	Stimulation factor (x-fold)				**Absolute change of flux (µmol N m^{-2} h^{-1})**		**Total DIN flux (µmol N m^{-2} h^{-1})**	
	Nitrification	Denitrification	NH_4^+-Flux	NO_3^--Flux	NH_4^+-Flux	NO_3^--Flux	Control	Animals
Non-normalized	3.0 (2.3); 15	2.3 (1.3); 38	5.3 (4.1); 26	2.2 (2.2); 14	+235 (285); 31	–118 (381); 28	+24 (158); 27	+162 (372); 27
Normalized to J_{NH4}	4.2 (2.9); 6	1.9 (1.1); 16	5.5 (4.1); 25	2.2 (2.5); 11	+365 (332); 25	–36 (280); 22	+30 (234); 22	+392 (581); 22
Normalized to NO_3^-	2.8 (1.8); 11	2.2 (1.4); 33	5.9 (4.5); 20	2.2 (2.2); 14	+450 (522); 22	–218 (597); 20	+41 (296); 19	+305 (499); 19
Normalized to Temp	3.1 (2.3); 14	2.3 (1.4); 36	5.3 (4.2); 25	2.2 (2.2); 14	+243 (331); 30	–83 (242); 27	+21 (166); 26	+208 (463); 26

Stimulation factors, absolute changes of fluxes, and total DIN fluxes were calculated based on the data shown in Figure 3 and are presented as 'Average value (Standard deviation); Number of studies'. Stimulation factors and flux enhancement values denoted as 'Non-normalized' are the same as those presented in Table 1. The original data were normalized to the average NH_4^+-flux (J_{NH4} = 81 µmol m^{-2} h^{-1}) of all control sediments, the average NO_3^--concentration (NO_3^- = 96 µmol L^{-1}) of all studies, or the average temperature (Temp = 14°C) of all studies. Note that the number of studies varies between the different types of normalization because not all studies provided the respective information needed for normalization. Other explanations are the same as in Table 1.

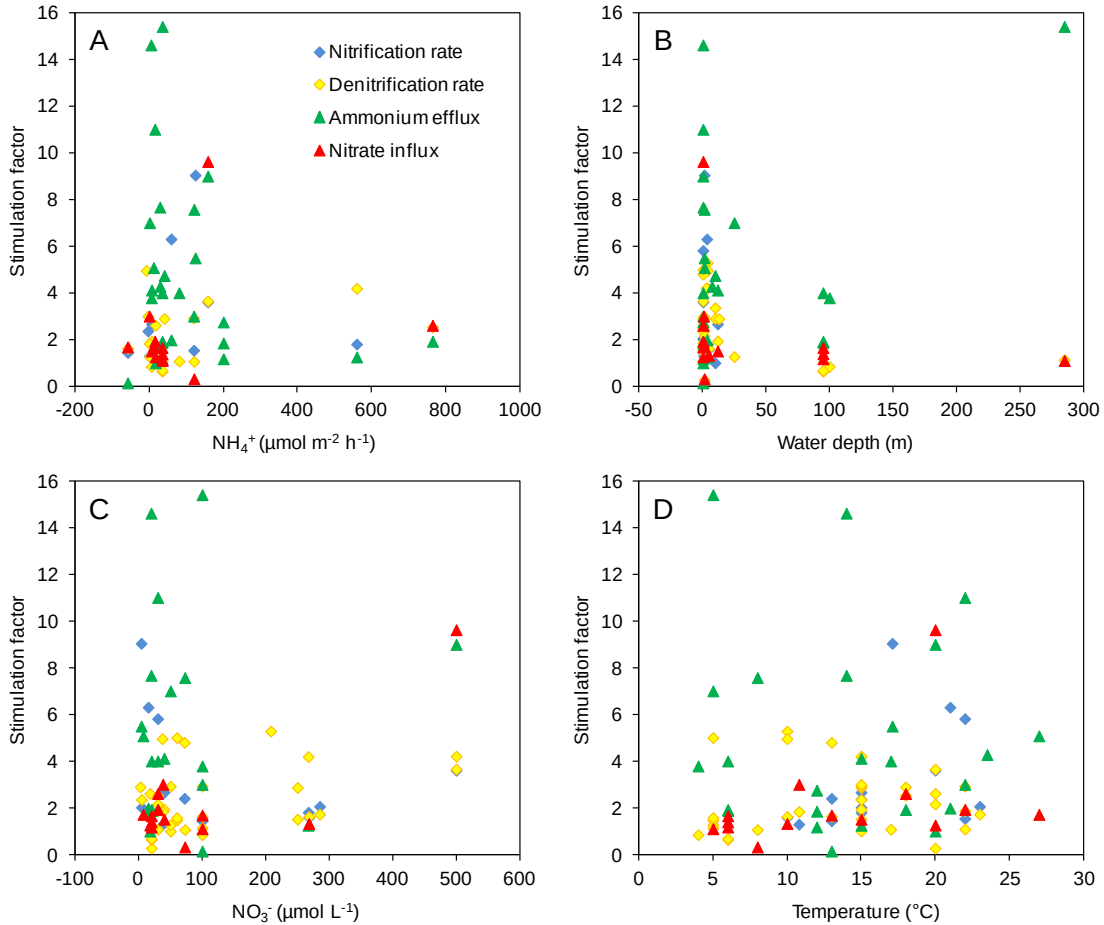

Figure S1: Correlation of stimulation factors for nitrification rate, denitrification rate, ammonium efflux, and nitrate influx with (A) ammonium efflux from sediments without animals, (B) water depth at which sediments were collected, (C) nitrate concentration in overlying water of incubated sediments, and (D) incubation temperature. Ammonium efflux and water depth are proxies of sediment reactivity; nitrate amendment and incubation temperature may affect sediment reactivity during the experimental incubations.

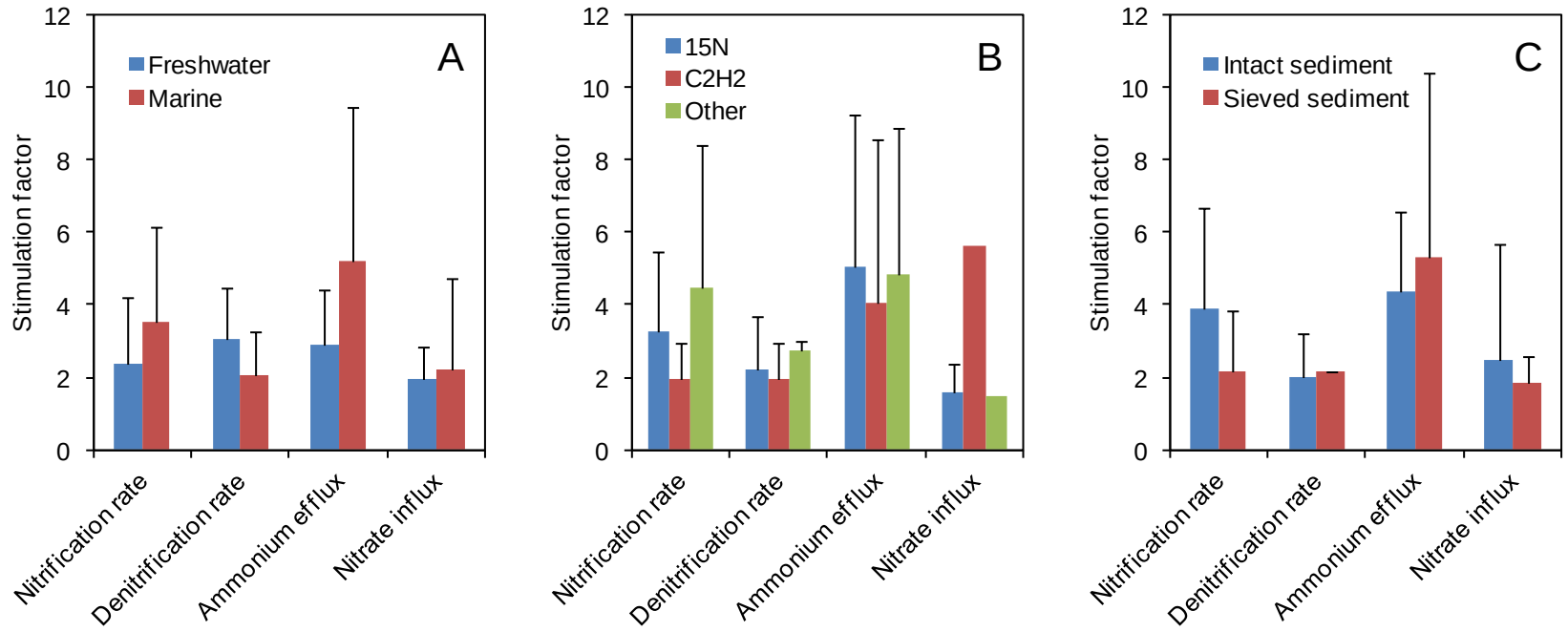

Figure S2: Variation of stimulation factors for nitrification rate, denitrification rate, ammonium efflux, and nitrate influx between (A) sediments from freshwater vs. marine ecosystems, (B) different methods for the quantification of denitrification, and (C) intact vs. sieved sediments. Average stimulation factors are shown; error bars indicate standard deviation; when no error bar is shown, the number of observations was smaller than 3.