

Supplement of

**Production of aerosol containing ice nucleating particles (INPs)
by fast growing phytoplankton**

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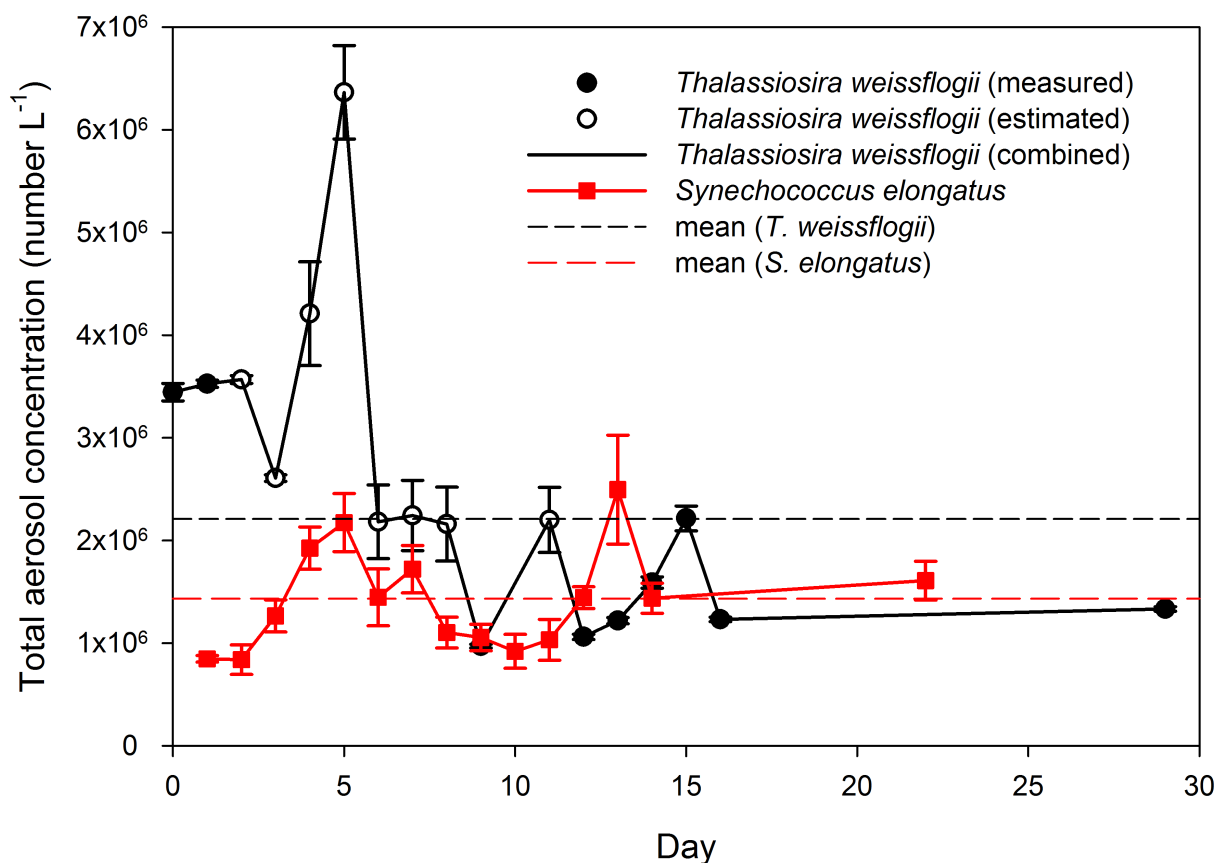


Figure S1. Aerosol number concentration (N_p) with time in the headspace above phytoplankton cultures in a marine aerosol reference tank (MART). Time series represent two experiments in which *Synechococcus elongatus* (cyanobacterium) and *Thalassiosira weissflogii* (diatom) were grown in batch culture. Sea spray aerosol (SSA) generated by a plunging waterfall in the MART. Data points show mean $\pm$ SD ($n = 360$). Note that on 6 days during the *T. weissflogii* MART, $n < 360$ (ranging from 140 (day 11) to 347 (day 13)). The “estimated” total aerosol concentration values for the *T. weissflogii* mesocosm were calculated by determining the linear relationship between the total aerosol concentration (as measured by the TSI water CPC) and the “total” aerosol concentration from the Grimm 1.108/PAS (sum over bins, 0.30-20 microns) using data from only the days on which data was collected for both:

$$\text{Total}_{\text{estimated}} = 152.53 \cdot \text{Total}_{\text{PAS}} - 23.693 \quad R^2 = 0.70$$

Using this relationship to estimate the “total” aerosol concentration on days during which the Grimm 1.108/PAS collected data, but the TSI water CPC did not.

Table S1 Aerosol number concentrations (N_p) (cm^{-3}) in a seawater bank marine aerosol reference tank (MART).

Day	conditions	Aerosol number concentration (N_p) (cm^{-3})
1	ASW	680
2	ASW	921
4	ASW + L1	1011
5	ASW + L1	1053

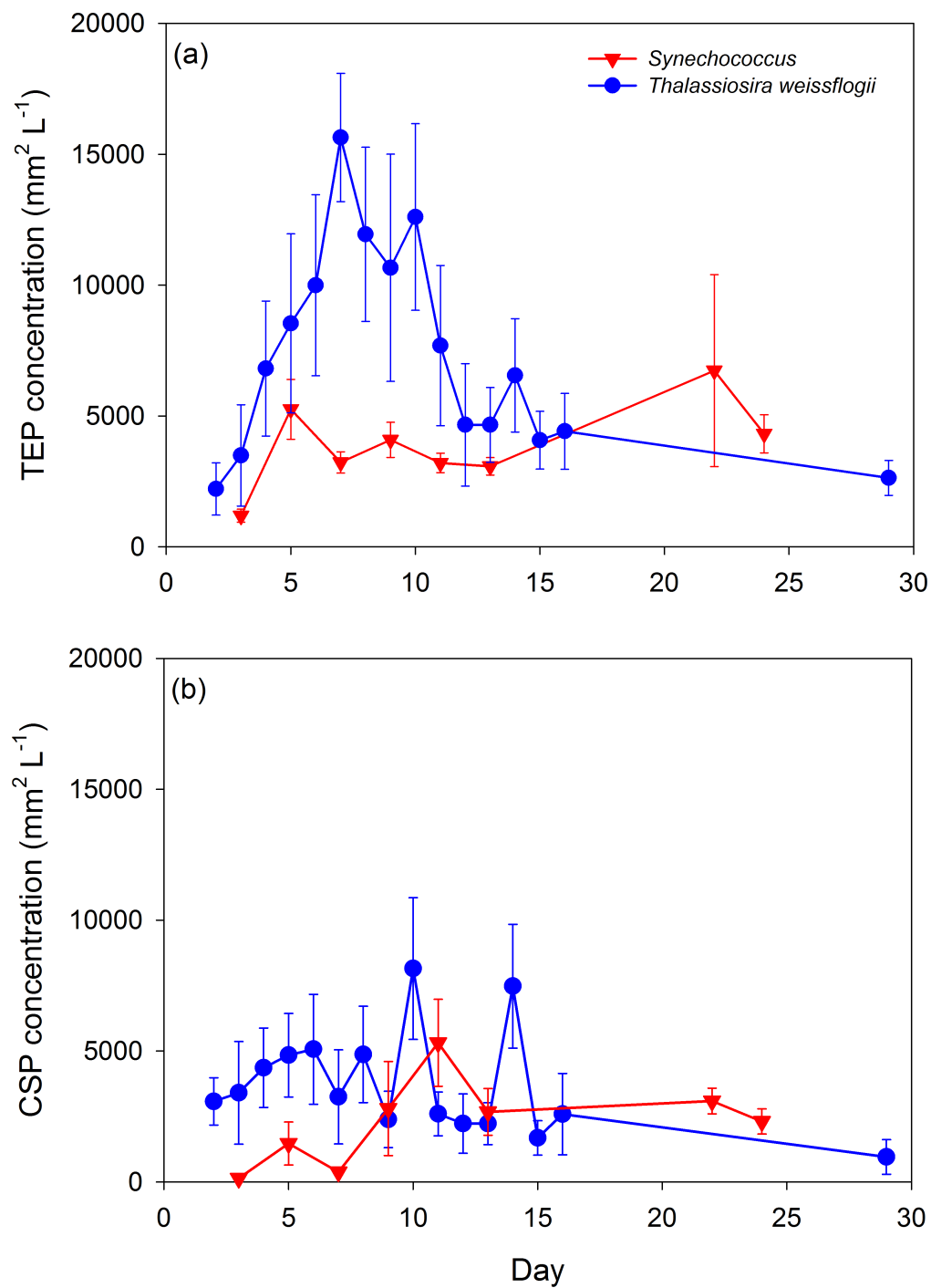


Figure S2. Concentration of exopolymer particles in cultures of *Synechococcus elongatus* (cyanobacterium) and *Thalassiosira weissflogii* (diatom) grown in a marine aerosol reference tank (MART). **A.** Concentration of transparent exopolymer particles (TEP) with time. **B.** Concentration of Coomassie stainable particles (CSP) with time. Data points show mean ($\pm$ SD, $n = 3$).

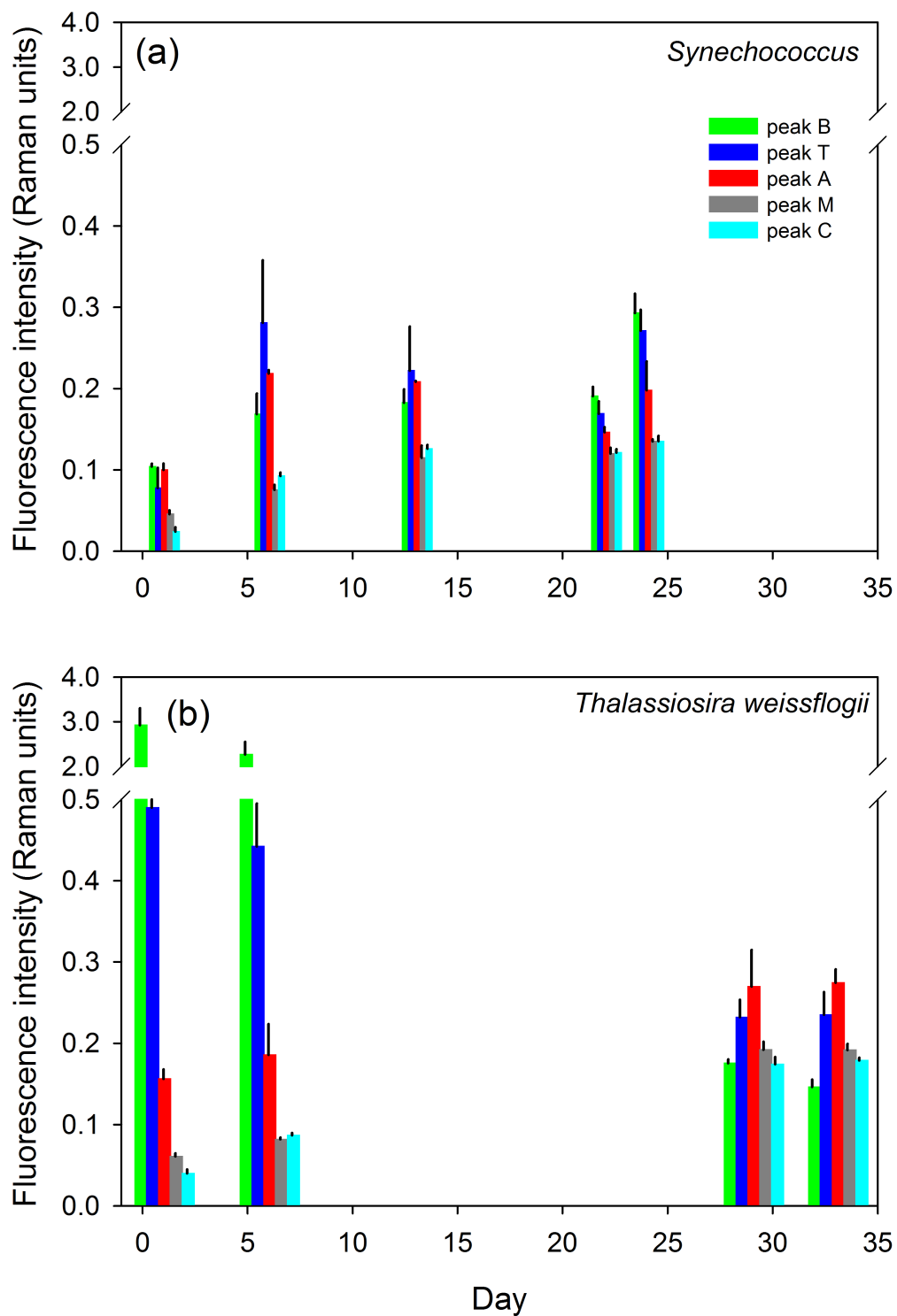


Figure S3. Concentration of fluorescent dissolved organic matter (FDOM) with time quantified by the fluorescence intensity of Coble's peaks in phytoplankton cultures grown in a marine aerosol reference tank (MART). **A.** *Synechococcus elongatus* (cyanobacterium) **B.** *Thalassiosira weissflogii* (diatom). Bars show mean + SD, (n = 3).

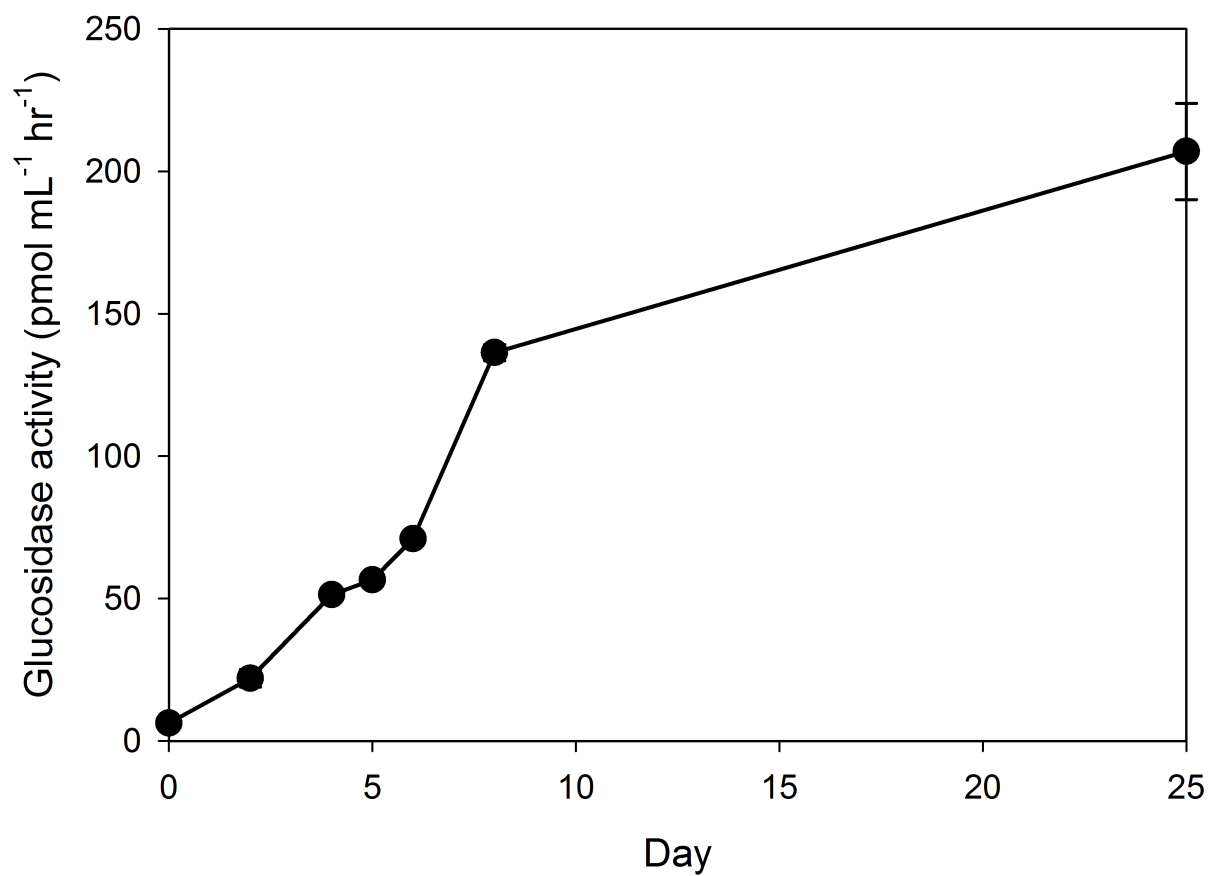


Figure S4. Glucosidase activity as a proxy for heterotrophic activity with time in a culture of *Thalassiosira weissflogii* (diatom) grown in a marine aerosol reference tank (MART). Data points show mean ($\pm$ SD, $n = 12$).