Supplement of

Observational evidence for the formation of ocean DMS-derived aerosols during Arctic phytoplankton blooms

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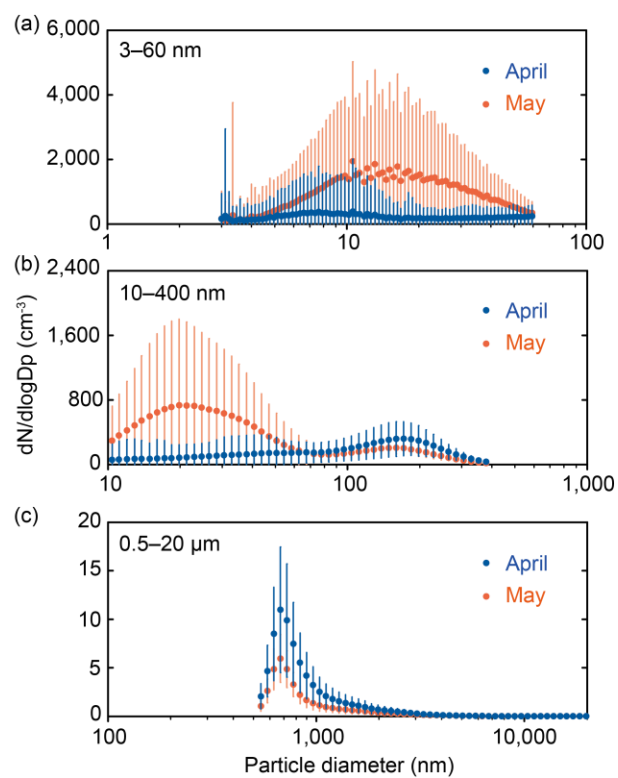
Figure S1: Monthly mean size distribution of particles measured at the Gruvebadet observatory in April (blue circles) and May (red circles) 2015. (a) Particles 3–60 nm, (b) particles 10–500 nm, and (c) particles 0.5–20 µm.
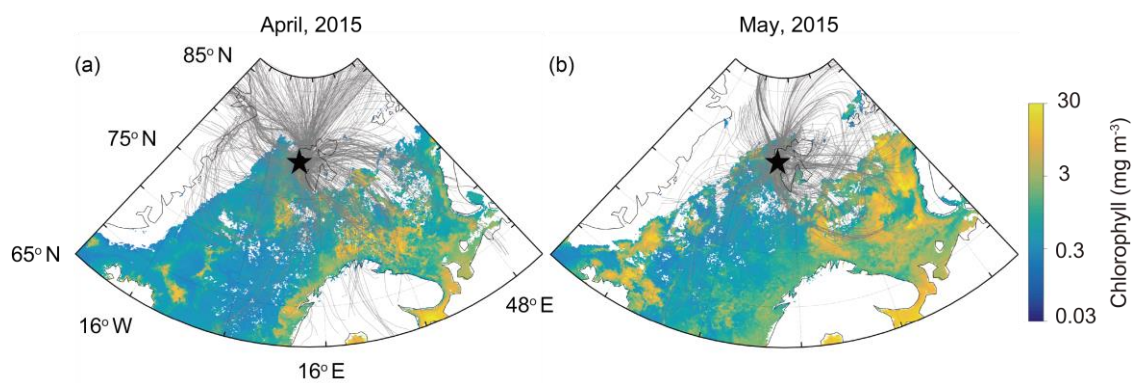
Figure S2: Monthly mean chlorophyll concentration during (a) April and (b) May 2015, overlaid with the 2-day air mass back trajectories collected at hourly intervals. The star symbol indicates the location of Ny-Ålesun (78.5° N, 11.8° E), Svalbard.
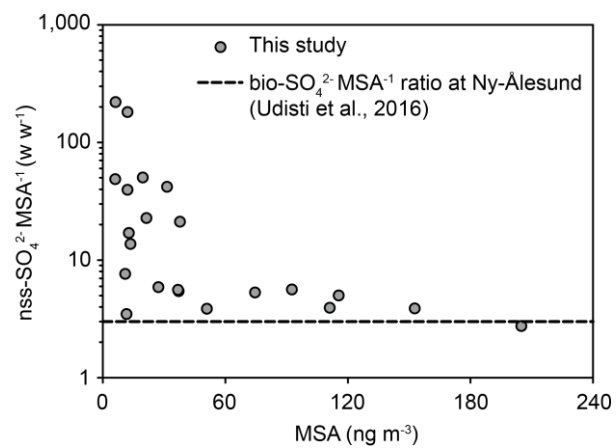
Figure S3: Relation between the nss-SO_4^{2-}/MSA ratio and the MSA concentration ($PM_{2.5}$; April and May 2015; grey circles). The dashed line indicates the bio-SO_4^{2-}/MSA ratio measured at Ny-Ålesund in 2014 (Udisti et al., 2016).
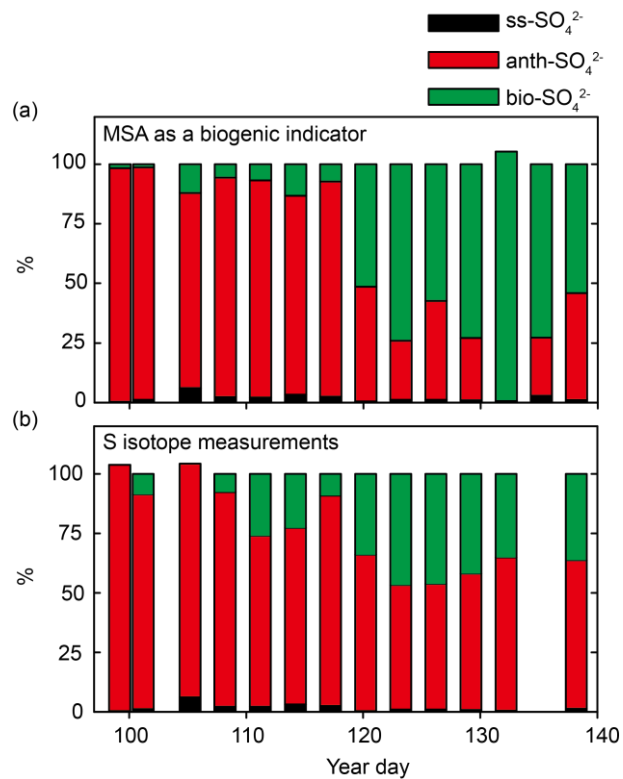
Figure S4: SO$_4^{2-}$ aerosol sources including sea salt (ss) SO$_4^{2-}$, anthropogenic (anth) SO$_4^{2-}$ and DMS-derived (bio) SO$_4^{2-}$, estimated using (a) MSA as a biogenic indicator, and (b) stable S isotope techniques.
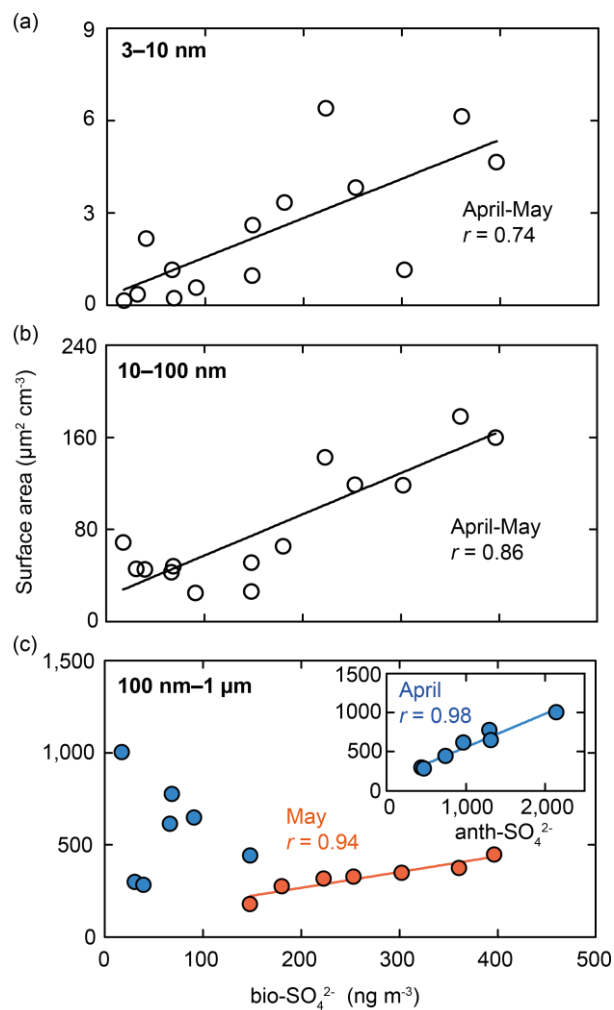
Figure S5: Relationships between the concentration of biogenic (bio) SO_4^{2-} and the surface area of particles of various sizes in April and May. (a) Particles 3–10 nm, (b) particles 10–100 nm, and (c) particles 100 nm–1 µm. The black solid lines in Fig. S5a and S5b indicate the best fit between biogenic SO_4^{2-} and the surface area of particles during April and May 2015. Blue and red circles in Fig. S5c indicate data obtained in April (Arctic haze period) and May (phytoplankton bloom period), respectively. The red solid line in Fig. S5c indicates the best fit between biogenic SO_4^{2-} and the surface area of particles in May 2015, and the blue solid line in the inset of Fig. S5c indicates the best fit between anthropogenic (anth) SO_4^{2-} and the surface area of particles in April 2015.
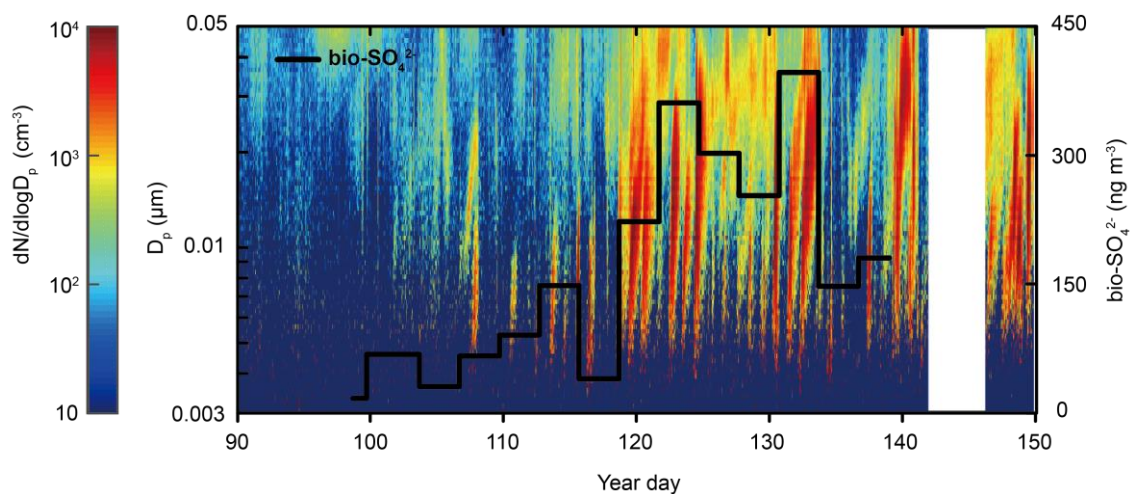
Figure S6: Spectral plot of number size distribution (dN/dlogD$_p$) as a function of year day during April and May 2015. The solid line represents the concentrations of biogenic SO$_4{}^{2-}$.