



Supplement of

Dimethyl sulfide cycling in the sea surface microlayer in the southwestern Pacific – Part 2: Processes and rates

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Table SI 1: Results from the Shapiro normality test of the different variables in the SML. If the p value is higher than 0.05, the variable is considered as normally distributed. The variables that are not normally distributed are underlined.

Variables	p value	Variables	p value	Variables	p value
Diatom	0.38	Bact. abundance	0.81	$k_{\text{DMS ir}}$	0.14
Dinoflagellate	0.09	<10 μm	0.09	$k_{\text{DMSP cn}}$	0.48
Small flagellate	0.82	<u>10-20 μm</u>	<u>0.03</u>	$k_{\text{DMSP ir}}$	0.32
<i>Gymnodinium</i>	0.29	20-50 μm	0.32		
<u>Chl-a</u>	<u>0.03</u>	>50 μm	0.09		
DMSP	0.64	<u>$k_{\text{DMS cn}}$</u>	<u>0.05</u>		
<u>DMS</u>	<u>0.02</u>	$k_{\text{DMS pr}}$	0.31		

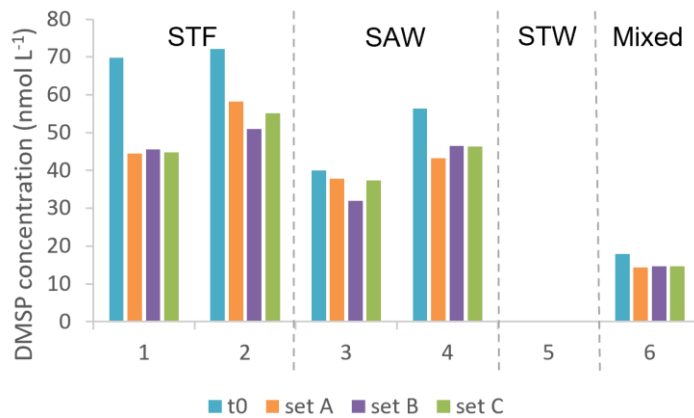


Figure S1: Initial and final DMSP concentration in the different treatments of SML water at each station. T_0 was the DMSP concentration determined from the original water sample, set A corresponds to sea surface microlayer (SML) water incubated in the light, set B to SML water incubated in the dark, and set C to SML water incubated in the dark with dimethyl disulfide (DMDS) addition to a final concentration of 200 nmol L⁻¹. Water mass type is indicated by the label at the top of the figure (subtropical front as STF, subantarctic water as SAW, subtropical water as STW, and a mixture of coastal and shelf water with STW as Mixed) and is separated by vertical dashed lines.

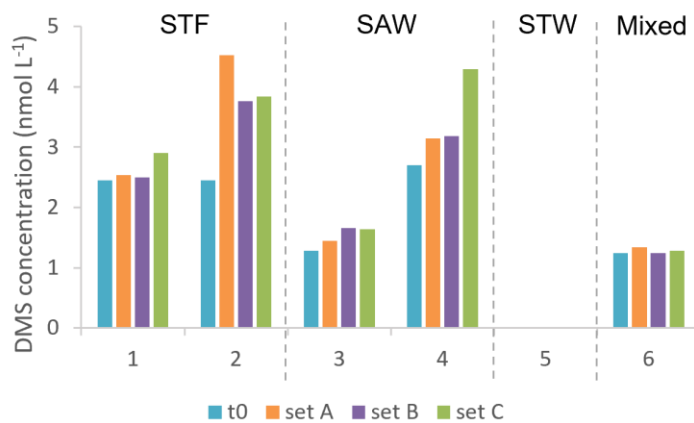


Figure S2: Initial and final DMS concentrations in the different SML treatments at each station. T_0 was the DMS concentration determined from the original water sample, set A corresponds to sea surface microlayer (SML) water incubated in the light, set B to SML water incubated in the dark, and set C to SML water incubated in the dark with dimethyl disulfide (DMDS) addition to a final concentration of 200 nmol L⁻¹. Water mass type is indicated by the label at the top of the figure (subtropical front as STF, subantarctic water as SAW, subtropical water as STW, and a mixture of coastal and shelf water with STW as Mixed) and is separated by vertical dashed lines.

Table S2: Summary of Pearson test results and Spearman's rank correlation (underlined) for DMSP and DMS processes. The correlations are significant when r or ρ (for Pearson and Spearman's rank tests, respectively) is > 0.5

and $p < 0.05$, and are indicated by *. Diatom, dinoflagellate and small flagellate biomass from optical microscopy and size fraction summed biovolume from Flowcam.

Processes Variables	$k_{\text{DMS cn}}$	$k_{\text{DMS pr}}$	$k_{\text{DMS ir}}$	$k_{\text{DMSP cn}}$	$k_{\text{DMSP ir}}$
Diatom	<u>-0.80 (0.33)</u>	0.30 (0.70)	0.32 (0.68)	-0.94 (0.06)	-0.55 (0.45)
Dinoflagellate	<u>-0.60 (0.42)</u>	0.18 (0.82)	0.04 (0.96)	-0.99 (0.01*)	-0.39 (0.61)
Small flagellate	<u>-0.40 (0.75)</u>	0.82 (0.18)	0.04 (0.96)	0.42 (0.58)	-0.56 (0.44)
<i>Gymnodinium</i>	<u>-0.60 (0.42)</u>	0.37 (0.63)	0.20 (0.80)	-0.95 (0.05*)	-0.50 (0.50)
Chl <i>a</i>	<u>-0.50 (0.45)</u>	<u>0.70 (0.23)</u>	<u>0.40 (0.52)</u>	<u>-0.90 (0.08)</u>	<u>0.20 (0.78)</u>
DMSP	<u>-0.50 (0.45)</u>	0.65; (0.23)	0.46 (0.44)	-0.92 (0.03*)	0.14 (0.82)
DMS	<u>-0.56 (0.32)</u>	<u>0.67 (0.22)</u>	<u>0.56 (0.32)</u>	-0.87 (0.05*)	<u>0.15 (0.80)</u>
Bact. abundance	<u>-0.30 (0.68)</u>	0.07 (0.91)	0.80 (0.11)	-0.56 (0.32)	0.06 (0.93)
<10 μm	<u>-0.80 (0.13)</u>	0.22 (0.73)	0.33 (0.59)	-0.42 (0.48)	-0.63 (0.25)
10-20 μm	<u>-0.70 (0.23)</u>	<u>0.80 (0.13)</u>	<u>0.60 (0.35)</u>	<u>-0.60 (0.35)</u>	<u>0 (1)</u>
20-50 μm	<u>-0.60 (0.35)</u>	0.44 (0.46)	0.91 (0.03*)	-0.81 (0.10)	0.46 (0.44)
>50 μm	<u>-0.60 (0.35)</u>	0.21 (0.74)	0.61 (0.28)	-0.97 (<0.01*)	0.21 (0.73)