

**Atmospheric deposition promotes relative abundance of
main dimethylsulfoniopropionate producers in the western
North Pacific**

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Method S1. Water sampling, nutrient and aerosol amendments and incubation.

To avoid vessel and other metal contamination as much as possible, we sailed out a wooden boat (Huaniao) or reached the HDPE water pipe out about 3 meters from the gunwale tied on a fishing rod, with a ceramic plumb hanging on the end (cruise). On the island, we filled up the 50 L carboys using plastic buckets and funnels, while during the cruise, the air compressor (Jiebao, 8BAR) and diaphragm pump (Wilden, P100/PVDF+Teflon, USA) were introduced to pump water up. All sampled water was covered with black bags and filtered through 150 μ m nylon mesh tied to the faucet of carboys before experiments, removing larger zooplankton. After dividing into PP cubitainers (Paerl et al., 1990) or HDPE culture bottles and adding nutrient solutions or aerosol extracts, these marked treatments were soaked in the seawater (Huaniao: tied on the ropes fixed by fish rafts; cruise: floated in a cistern equipped with cyclic ballast seawater) and covered with a gray screen to weaken the sunlight intensity, simulating the light condition in the surface layer. In the laboratory, the illumination time and temperature were controlled to mimic the change of day and night. All the apparatuses used in the experiments, including pipes, carboys, cubitainers, measuring cylinder, etc. were dipped and washed with 0.2 M ultrapure HCl and then rinsed twice with MilliQ water in the laboratory before; and finally rinsed by sampled seawater when dividing initial water.

$(\text{NH}_4)_2\text{SO}_4$ (NH_4^+), NaNO_3 (NO_3^-), KH_2PO_4 (PO_4^{3-}) and Cu/Fe standard solution (ShijiAoke Biotechnology co. LTD, Beijing, China) were used for preparing the stock solutions of nutrients. Aerosols were previously sampled at Huaniao and analyzed by

Ion Chromatography (ICS3000, DIONEX, for determination of ions) and Inductively Coupled Plasma Optical Emission Spectroscopy (SPECTRO, Germany, for detection of total and soluble elements). Backward trajectories were applied for further analysis (HYSPLIT (Hybrid Single-Particle Lagrangian Integrated Trajectory) model from the NOAA Air Resource Lab). Aerosol membranes were cut into small pieces and ultrasonicated within MilliQ water for 40 min, acquiring the supernate and stored at 4°C. Extracts were usually prepared just before division and addition.

References

- Paerl, H.W., Rudek, J., Mallin, M.A., 1990. Stimulation of phytoplankton production in coastal waters by natural rainfall inputs: Nutritional and trophic implications. *Mar. Biol.* 107, 247–254.
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