Supplement of

Impact assessment of terrestrial and marine air-mass on the constituents and intermixing of bioaerosols over coastal atmosphere

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Table S1 Sample classification and description influenced by different air masses

Group		Samples									
	Date	19-Jan	20-Jan	1-Mar	9-Mar	11-Mar	12-Mar	22-Mar	23-Mar	24-Mar	25-Mar
TE	PM$_{2.5}$	51.35	124.67	30.58	16.5	65.63	38.21	53.05	77.46	84.42	60.83
	Sample	WH_1	WH_2	WH_7	WH_8	WH_10	WH_11	WH_15	WH_16	WH_17	WH_18
	Date	21-Jan	16-Mar	21-Mar	29-Mar						
MA	PM$_{2.5}$	7.92	12.38	15.37	25.38						
	Sample	WH_3	WH_13	WH_14	WH_20						
	Date	26-Feb	27-Feb	28-Feb	10-Mar	14-Mar	27-Mar				
MIX	PM$_{2.5}$	41.12	60.61	41	51.63	36.42	64.69				
	Sample	WH_4	WH_5	WH_6	WH_9	WH_12	WH_19				
PM$_{2.5}$ concentration (µg/m^3)	<35	35-75	75-150	150-250	>250						

TE, terrestrial air mass; MA, marine air mass; MIX, mix air mass.

Table S2 Indicator bacterial and fungal species influenced by different air masses

Group	Bacteria			Fungi		
	TE	MA	MIX	TE	MA	MIX
TE/MA/MIX	Enhydrobacter Cellulosimicrobium Pleomorphomonas	Comamonas Streptococcus Novosphingobium Aerococcus	Enhydrobacter Lactobacillus	Cladosporium	Aspergillus Coprinellus	Malassezia Alternaria
TE/MA	Lactobacillus Deinococcus Enhydrobacter Sphingomonas	Comamonas Streptococcus Novosphingobium Aerococcus Delftia Erysipelothrix Chryseobacterium		Cladosporium Alternaria Malassezia	Coprinellus	
MA/MIX		Comamonas Streptococcus Novosphingobium Aerococcus	Enhydrobacter Lactobacillus Cloacibacterium Cellulosimicrobium Pleomorphomonas Deinococcus Sphingomonas		Aspergillus Coprinellus	Malassezia Alternaria

TE, terrestrial air mass; MA, marine air mass; MIX, mix air mass.

Table S3 Ecological of functions of bacterial and fungal communities influenced by different air masses

Group	Bacteria			Fungi		
	TE	MA	MIX	TE	MA	MIX
TE/MA/MIX	animal_parasites_or_symbionts human_pathogens_all	hydrocarbon_degradation human_gut mammal_gut	aerobic_chemoheterotrophy animal_parasites_or_symbionts human_pathogens_all	Animal Pathogen-Undefined Saprotroph Animal Pathogen-Endophyte-Plant Pathogen-Wood Saprotroph	Dung Saprotroph-Plant Saprotroph-Wood Saprotroph	Animal Pathogen-Undefined Saprotroph Animal Pathogen-Endophyte-Plant Pathogen-Wood Saprotroph
TE/MA	animal_parasites_or_symbionts human_pathogens_all plant_pathogen	aromatic_compound_degradation human_gut mammal_gut hydrocarbon_degradation aromatic_hydrocarbon_degradation plastic_degradation		Animal Pathogen-Endophyte-Lichen Parasite-Plant Pathogen-Wood Saprotroph Animal Pathogen-Endophyte-Plant Pathogen-Wood Saprotroph Animal Pathogen-Undefined Saprotroph	Dung Saprotroph-Plant Saprotroph-Wood Saprotroph	

| MA/MIX | aerobic_chemoheterotrophy animal_parasites_or_symbionts human_pathogens_all nitrate_reduction | hydrocarbon_degradation human_gut mammal_gut | Dung Saprotroph-Plant Saprotroph-Wood Saprotroph | Animal Pathogen-Undefined Saprotroph Animal Pathogen-Endophyte-Plant Pathogen-Wood Saprotroph Animal Pathogen-Endophyte-Lichen Parasite-Plant Pathogen-Wood Saprotroph |

TE, terrestrial air mass; MA, marine air mass; MIX, mix air mass.
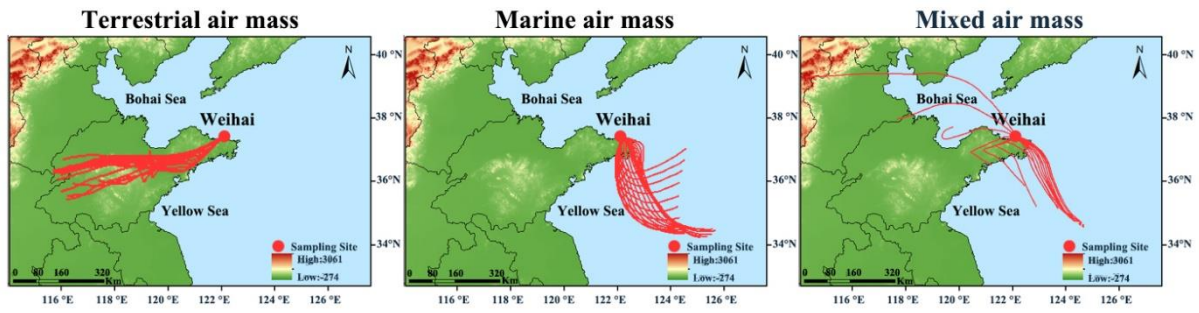
Fig. S1 The Sampling site in the coastal city of Weihai, Northern China, and the typical terrestrial, marine, and mixed air-mass are indicated.
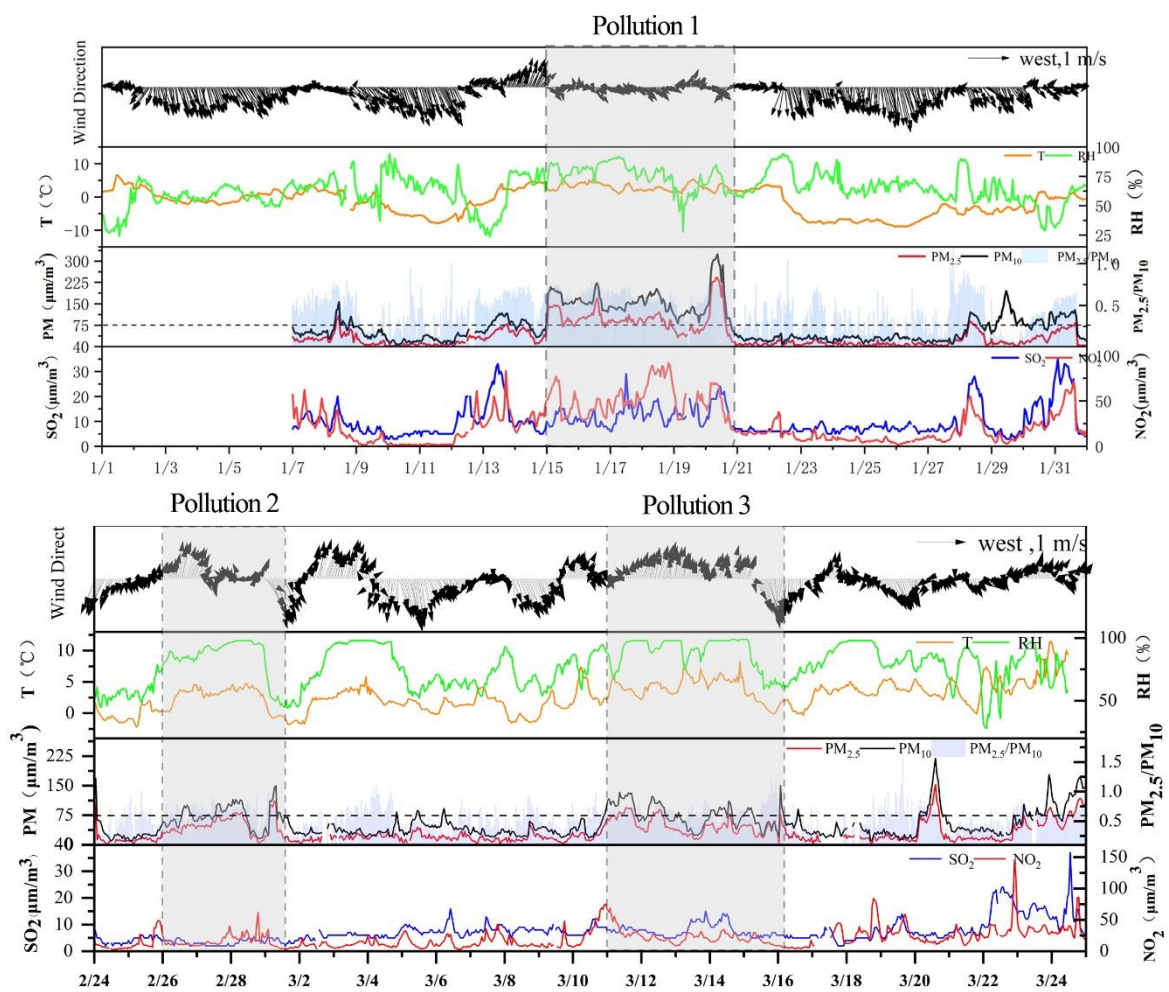
Fig. S2 Three typical heavy pollution episodes were examined to investigate variations of air mass during the sampling period
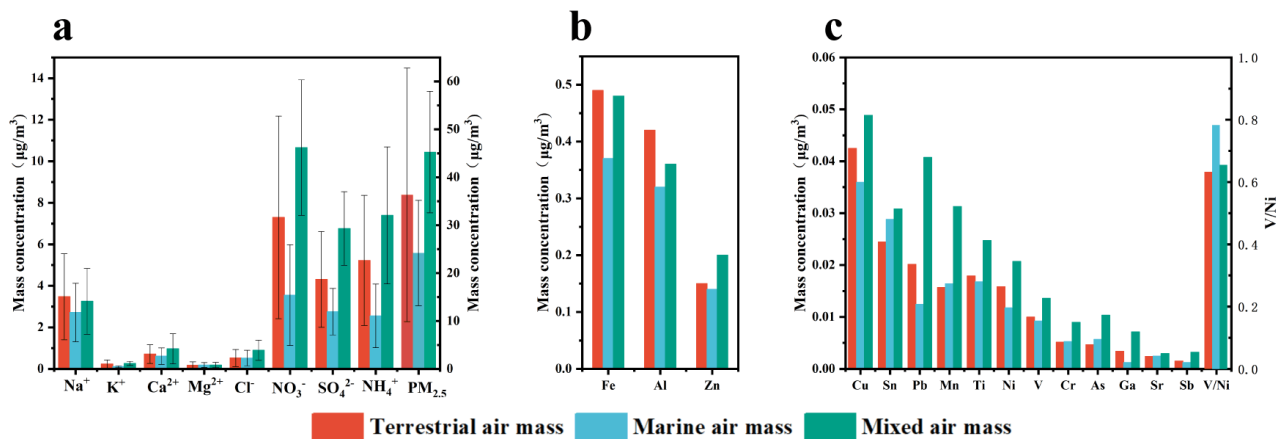
Fig.S3. Water-soluble ions (a) and metal element concentration (b, c) in PM$_{2.5}$ influenced by terrestrial, marine and mix air mass.
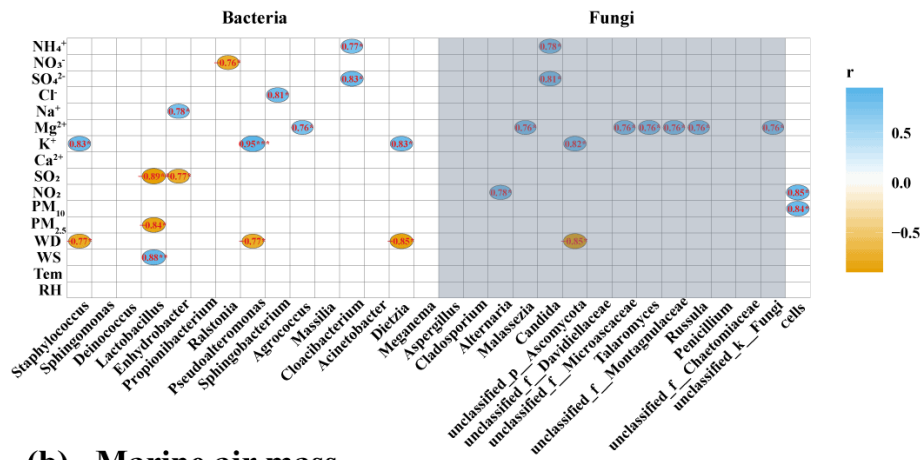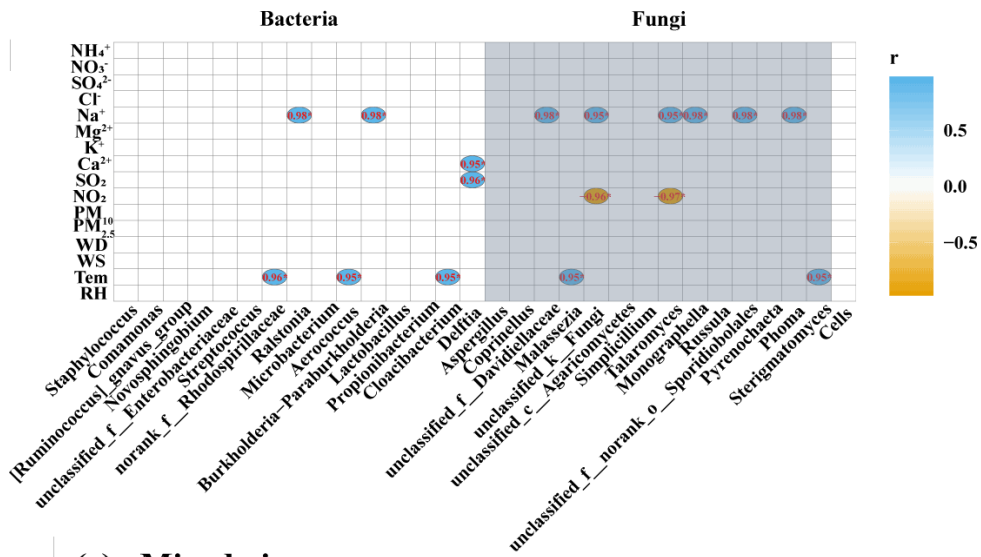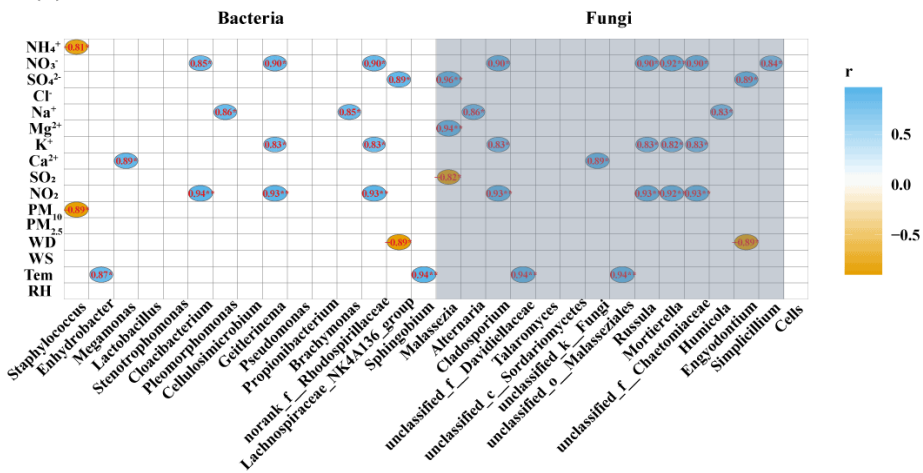
Fig. S4 Relationships between microorganisms and environmental factors under the influence of different air masses, continental air masses (a) marine air masses (b) and mixed air masses (c)