Chemical and microphysical properties of the aerosol during foggy and nonfoggy episodes: A relationship between organic and inorganic content of the aerosol

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Summary

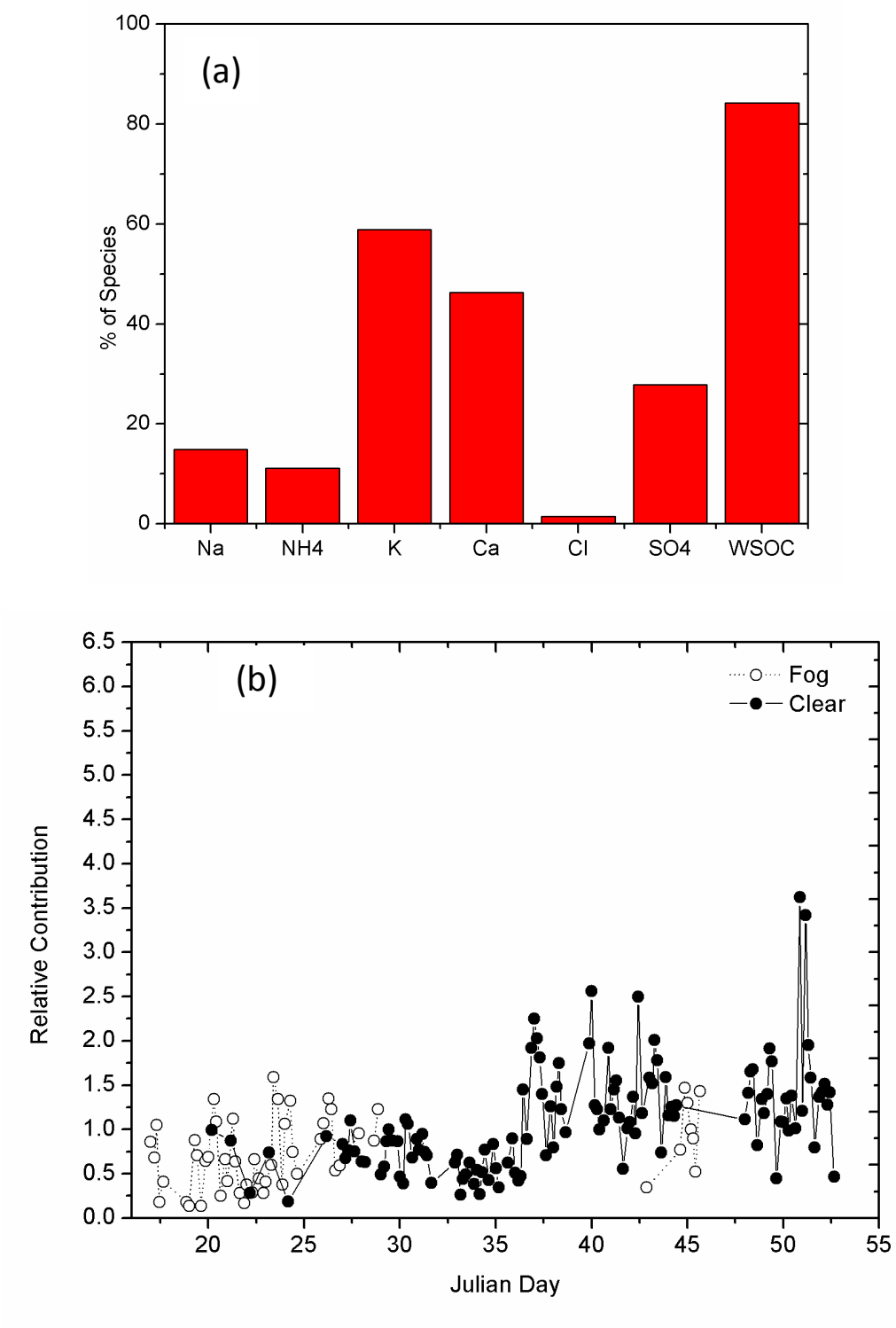
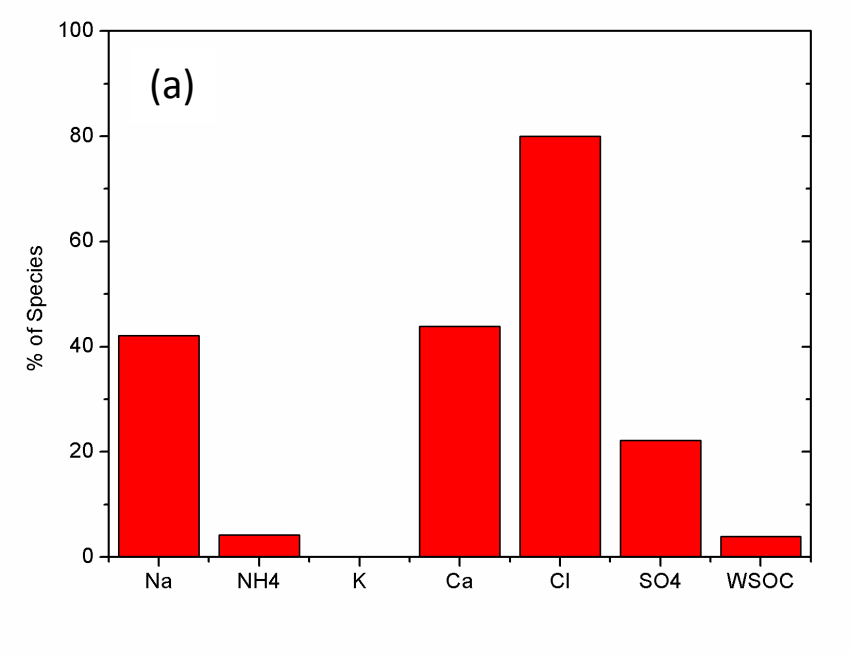


Fig S2- (a) Composition profile of species by factor F1-biomass burning during the study period (b) Time series of relative contribution of F1 during foggy day and nonfoggy (clear) episodes. WSOC is abbreviation of water soluble organic carbon.



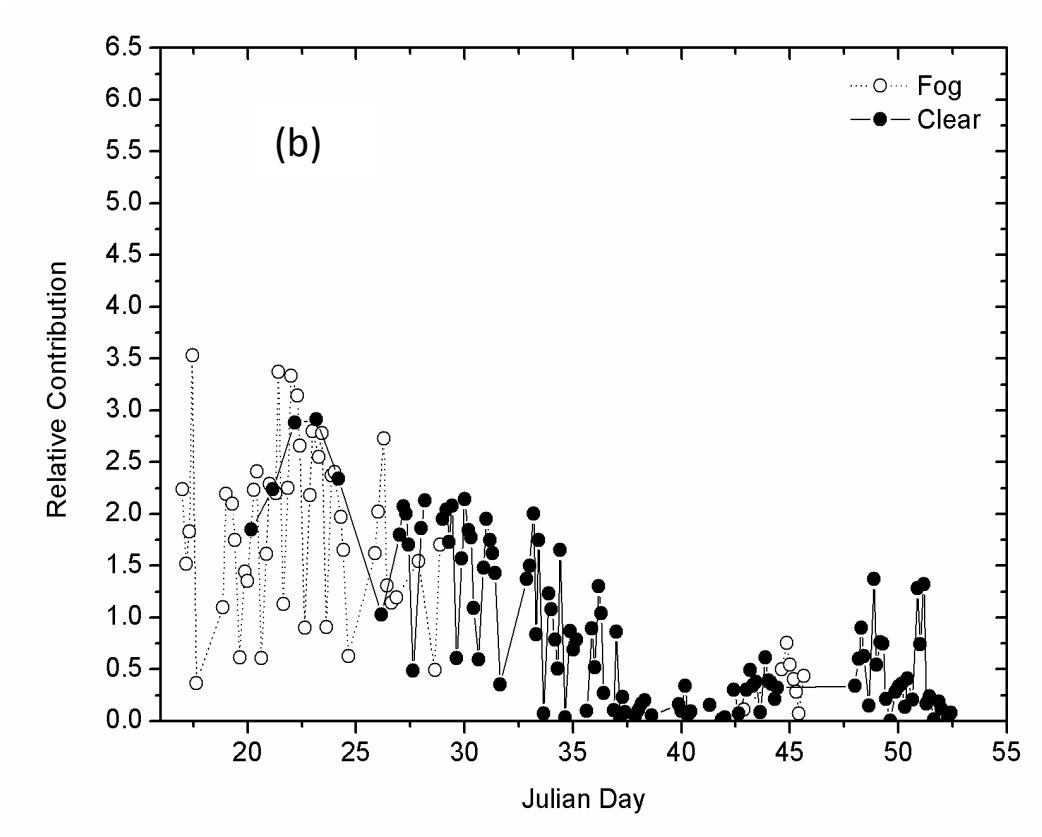
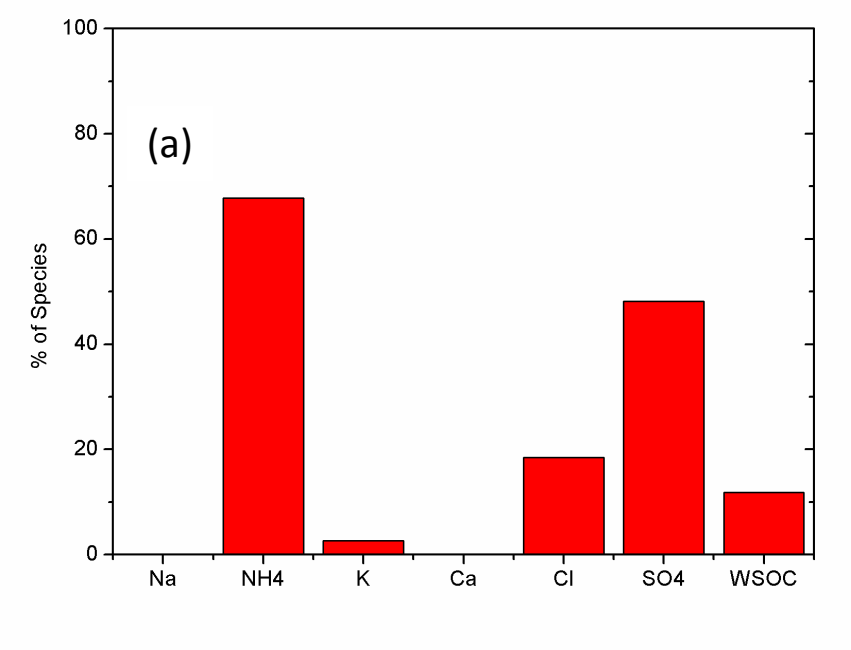


Fig S3- (a) Composition profile of species by factor F2-refractory source during the study period (b) Time series of relative contribution of F2 during foggy day and nonfoggy (clear) episodes. WSOC is abbreviation of water soluble organic carbon.



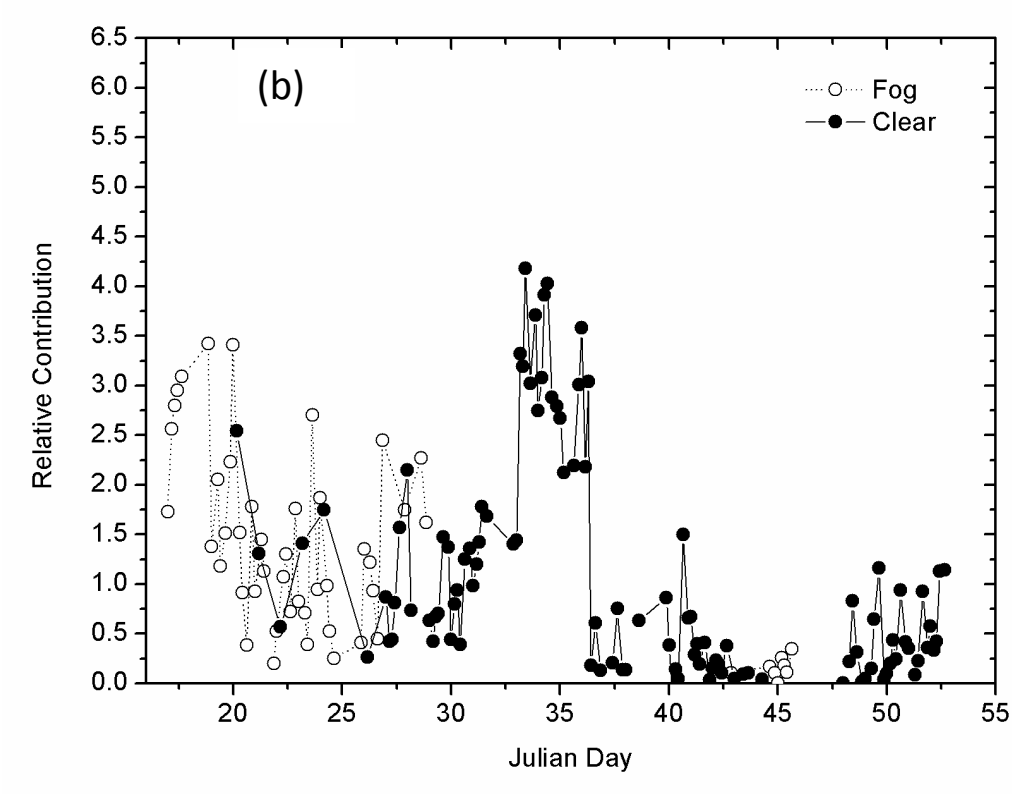
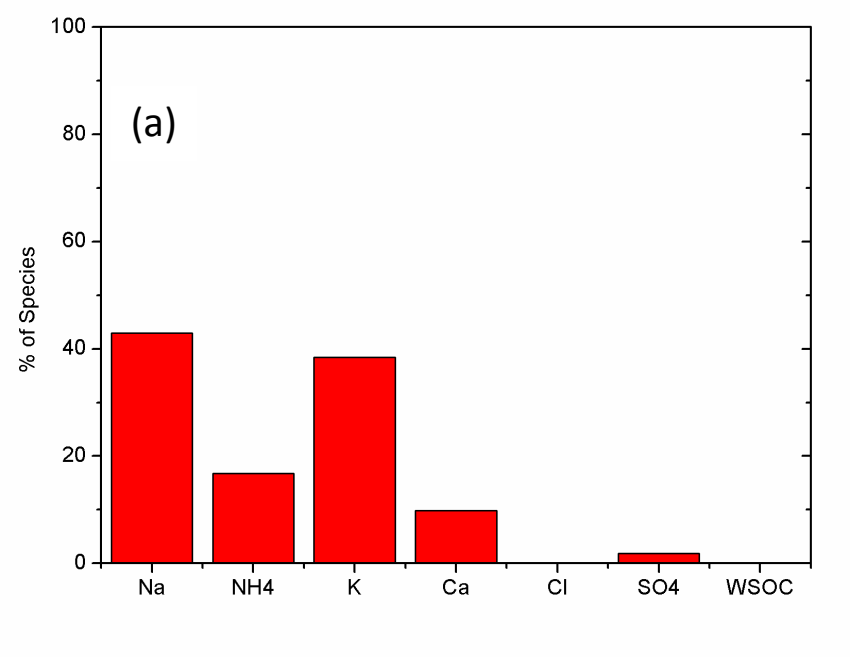


Fig S4- (a) Composition profile of species by factor F3-Secondary source during the study period (b) Time series of relative contribution of F3 during foggy and nonfoggy (clear) episodes. WSOC is abbreviation of water soluble organic carbon.



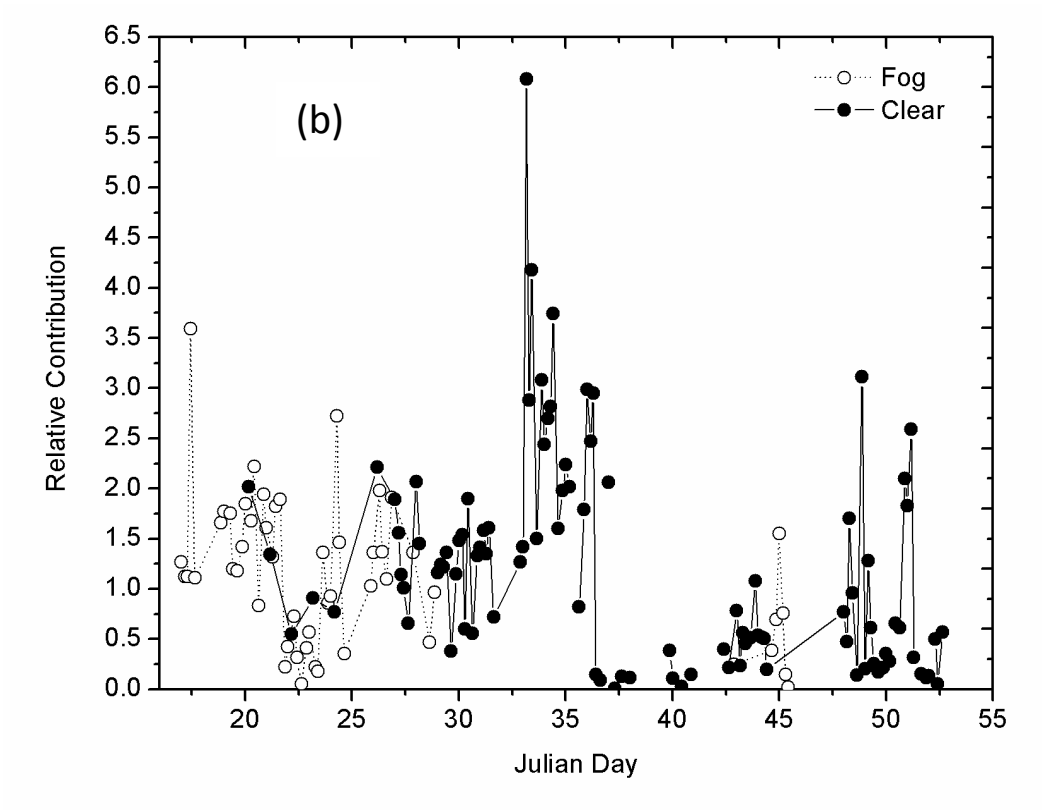


Fig S5- (a) Composition profile of species by factor F4- Dust/Mineral source during the study period (b) Time series of relative contribution of F3 during foggy and nonfoggy (clear) episodes. WSOC is abbreviation of water soluble organic carbon.

Table S6 (a): Average concentrations and standard deviations (± 1σ) of fogwater ionic species, D_a is aerodynamic diameter of the fog droplets

Species/D_a	16-22 µm	4-16 µm	< 4 µm
Na^+	44.22 ± 42.00	60.11 ± 70.57	208.26 ± 392.07
NH_4^+	155.48 ± 36.13	308.23 ± 359.65	324.74 ± 207.54
K^+	25.13 ± 17.02	40.10 ± 38.56	143.00 ± 178.69
Ca^{2+}	66.00 ± 38.93	73.41 ± 65.27	80.70 ± 73.82
Mg^{2+}	13.24± 12.76	26.17 ± 34.78	29.14 ± 35.36
F^-	04.40 ± 1.84	9.50 ± 7.75	28.33 ± 21.03
Cl^-	36.36 ± 24.23	58.72 ± 71.12	375.38 ± 472.97
NO_2^-	02.63± 4.48	6.32 ± 9.76	40.75 ± 43.42
NO_3^-	291.24± 311.98	314.92 ± 329.07	2308.00 ± 3572.507
SO_4^{2-}	201.54 ± 87.29	382.47 ± 463.84	1654.43 ± 2065.02

Table S6 (b): Study average concentrations and standard deviations (± 1σ) of total concentration (TC), modal diameter (Dm) and geometric standard deviation (GSD) during foggy and nonfoggy (clear) episode

LST (hours)	Dm_{fog} (nm)	Dm_{clear} (nm)	GSD_{fog}	GSD_{clear}	TC_{clear} (#/cc)	TC_{fog} (#/cc)
2.625	184.34±25.29	168.10±23.52	1.84±0.08	1.95±0.07	23664±14435	19148±12908
9	147.79±19.10	138.02±17.02	1.91±0.07	1.94±0.06	27422±13916	24417±15194
12.3	150.58±24.71	138.13±42.50	1.93±0.04	2.09±0.16	28009±12455	14426±9686
16.25	155.53±18.66	147.55±34.01	2.01±0.13	2.10±0.11	11084±11228	13426±9069
19.25	124.67±21.11	104.89±14.83	1.93±0.05	1.99±0.09	52261±35632	28213±16574
22.3	147.14±16.58	129.22±15.85	1.85±0.06	1.94±0.10	54125±38618	30764±20371

Table S7 –Correlation coefficient of inorganic species of fog droplets with organic carbon (OC) and inorganic carbon (IC) content of fog droplets of different aerodynamic diameter, D_a is aerodynamic diameter of the fog droplets

D_a/species	16-22 µm		4-16 µm		< 4 µm	
	OC	IC	OC	IC	OC	IC
Na^+	0.84	0.0200	0.60	0.79	0.94	0.0007
NH_4^+	0.07	0.0058	0.51	0.66	0.93	0.4627
K^+	0.97	0.0032	0.94	0.93	0.85	0.2746
Ca^{2+}	0.93	0.0042	0.86	0.81	0.97	0.0319
Mg^{2+}	0.89	0.0009	0.73	0.81	0.81	0.3224
F^-	0.18	3.30E-05	0.57	0.41	0.54	0.0019
Cl^-	0.91	0.0199	0.86	0.73	0.96	0.0040
NO_3^-	0.34	0.0150	0.89	0.76	0.82	0.0011
SO_4^{2-}	0.09	0.0460	0.63	0.54	0.70	0.0336

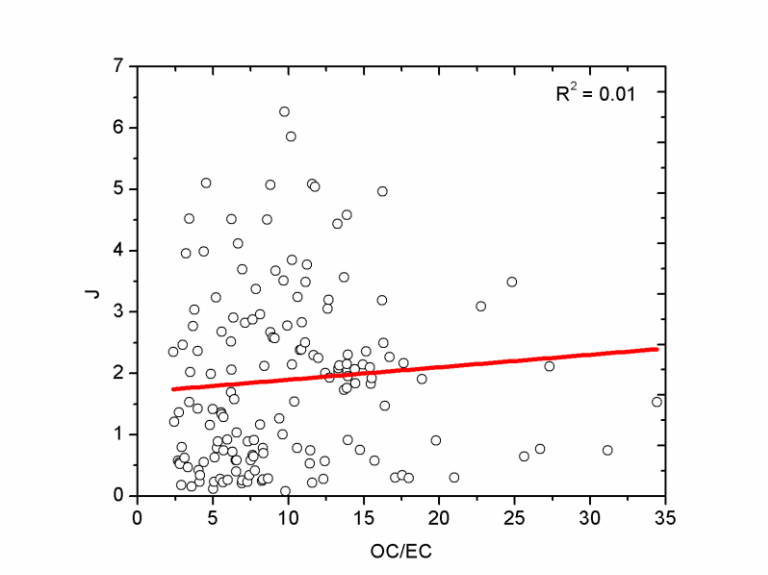


Fig S7 – Ordinary linear regression between organic carbon (OC) to elemental carbon (EC) ratio and J. J is defined as J= $NH_4^+/(2\ SO_4^{2-} + NO_3^-)$. Concentrations of inorganic species were in µeq m^{-3} unit. Poor correlation coefficient shows negligible influence of acidity on secondary organic aerosol production

Table S8 – Ammonium, sulfate and nitrate concentration in μg m^{-3} during fog evaporation, LST stands for local standard time

Species (μg m^{-3})/LST	LST (hours)		
	2.63	9	12.3
NH_4^+	30.00±18.55	59.10±21.94	80.65±14.61
NO_3^-	15.84±22.10	14.72±9.15	15.61±11.65
SO_4^{2-}	10.61±7.79	31.58±50.37	18.92±8.35

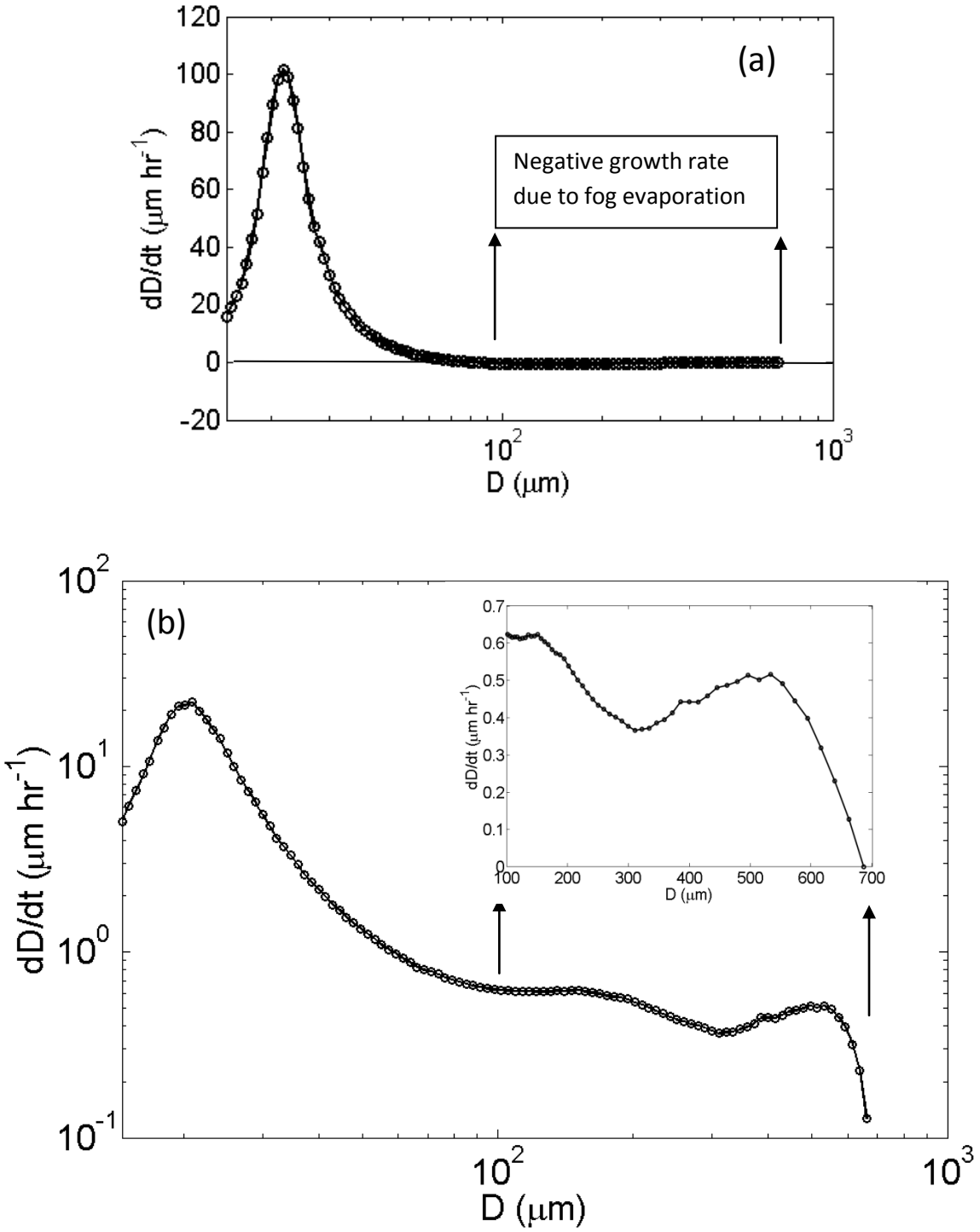


Fig S9- The study average particle diameter growth rate during foggy day from overnight (~ 2.6 LST) to 9 LST (a) and from 9 LST to 12.3 LST (b) which are the period of fog evaporation and aqueous phase formation of secondary organic aerosols

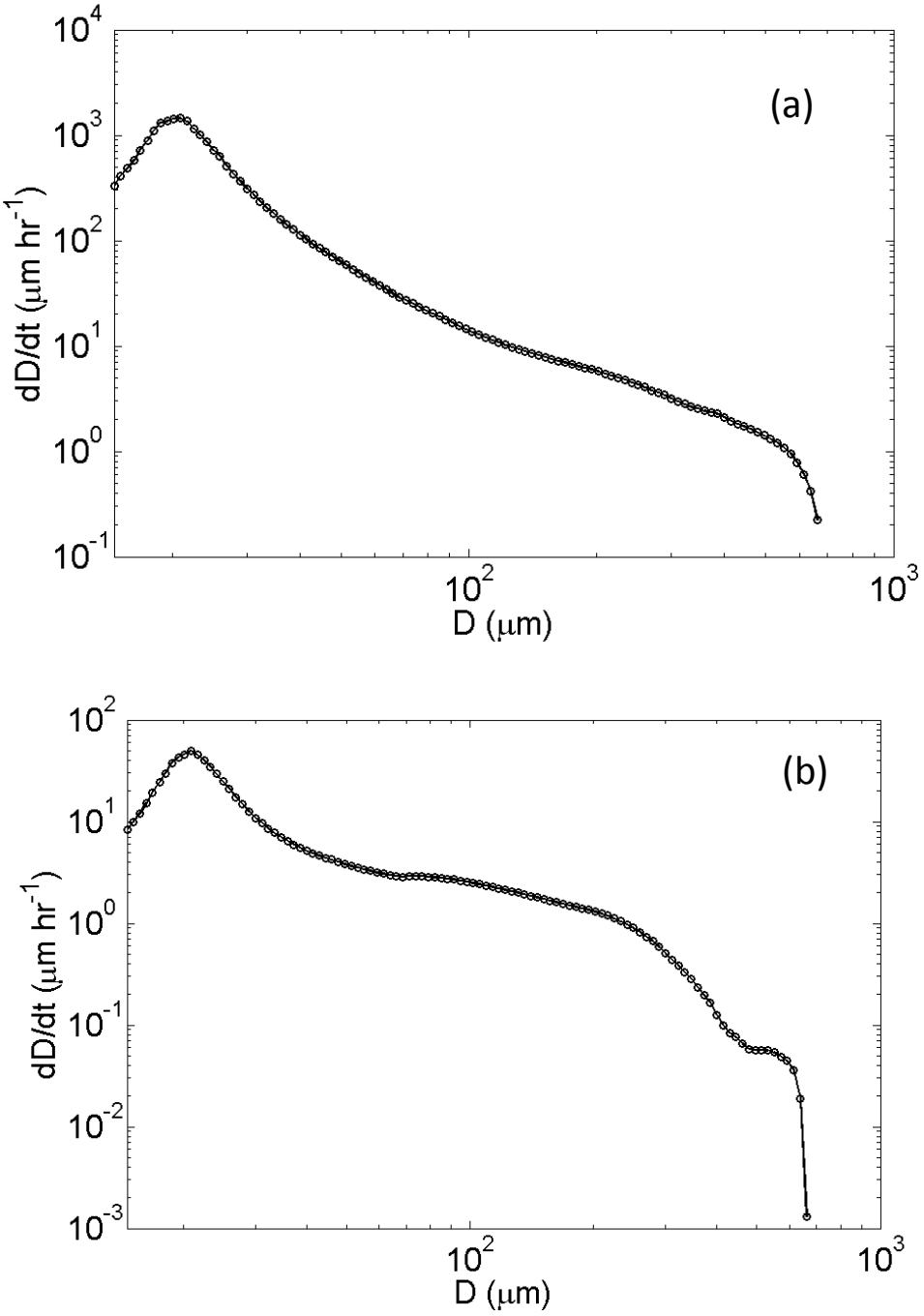


Fig S10- The study average particle diameter growth rate during foggy day from ~ 16.2 LST to ~19.2 LST(a) and from ~19.2 LST to ~22.3 LST (b) which are the period of fog formation