**A sub-decadal trend of diacids in atmospheric aerosols in East Asia**

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| **Table S1.** Correlations (r2) of the concentrations of selected major diacids with the studied years (2001 - 2008). The r2 values were calculated by the linear regression using least squares. The values | | | | | | |
| in the brackets show the p values at the 95% confidence level. The p values were calculated based on the median concentrations using the analysis of variance (ANOVA) technique. The significant trends (p < 0.05) have been made bold. | | | | | | |
| Month | Oxalic acid | Malonic acid | Succinic acid | Adipic acid | Methylsuccinic acid | Phthalic acid |
| January | 0.08 (0.595) | 0.02 (0.798) | 0.16 (0.440) | 0.55 (0.091) | 0.17 (0.414) | 0.07 (0.613) |
| February | **0.87 (0.025)** | 0.43 (0.159) | 0.56 (0.085) | **0.86 (0.008)** | 0.38 (0.190) | 0.34 (0.200) |
| March | 0.57 (0.143) | 0.39 (0.259) | 0.74 (0.062) | 0.63 (0.104) | 0.58 (0.132) | **0.84 (0.027)** |
| May | 0.13 (0.486) | 0.05 (0.660) | 0.001 (0.990) | 0.23 (0.412) | **0.66 (0.048)** | 0.55 (0.093) |
| June | 0.11 (0.459) | 0.06 (0.588) | 0.11 (0.457) | 0.09 (0.514) | 0.34 (0.172) | 0.002 (0.989) |
| July | 0.45 (0.217) | 0.04 (0.732) | 0.07 (0.662) | 0.01 (0.847) | 0.01 (0.869) | 0.03 (0.779) |
| August | 0.21 (0.443) | 0.06 (0.702) | 0.07 (0.662) | 0.05 (0.712) | 0.33 (0.309) | 0.19 (0.458) |
| September | 0.03 (0.771) | 0.11 (0.583) | 0.11 (0.579) | 0.11 (0.583) | 0.01 (0.917) | 0.60 (0.122) |
| October | 0.07 (0.623) | 0.04 (0.703) | 0.25 (0.313) | 0.003 (0.914) | 0.20 (0.379) | 0.15 (0.450) |
| November | 0.10 (0.492) | 0.05 (0.616) | 0.20 (0.317) | 0.13 (0.419) | 0.001 (0.990) | 0.04 (0.653) |
| December | 0.26 (0.297) | 0.33 (0.230) | 0.38 (0.189) | 0.43 (0.157) | 0.20 (0.370) | **0.69 (0.040)** |

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| **Table S2.** Correlations (r2) of the concentrations of a combustion tracer (CO) and precursors (glyoxylic acid, glyoxal and methylglyoxal) of oxalic acid with the studied years (2001 - 2008). The r2 values were calculated by the linear regression using least squares. The values in the bracket show the p values at the 95% confidence level. The p values were calculated based on the median concentrations using the analysis of variance  (ANOVA) technique. The significant (p < 0.05) trends have been made bold. | | | | |
| Month | CO | Glyoxylic acid | Glyoxal | Methylglyoxal |
| January | **0.88 (0.001)** | 0.11 (0.512) | 0.23 (0.335) | 0.54 (0.658) |
| February | 0.04 (0.657) | 0.33 (0.236) | 0.59 (0.075) | 0.28 (0.285) |
| March | 0.24 (0.264) | 0.34 (0.305) | 0.39 (0.182) | 0.004 (0.906) |
| May | 0.15 (0.350) | 0.03 (0.746) | **0.70 (0.037)** | 0.09 (0.555) |
| June | 0.10 (0.434) | 0.27 (0.231) | 0.01 (0.888) | 0.14 (0.417) |
| July | 0.21 (0.251) | 0.03 (0.791) | 0.26 (0.302) | 0.14 (0.417) |
| August | 0.00 (0.986) | 0.40 (0.256) | 0.03 (0.743) | 0.09 (0.572) |
| September | **0.50 (0.053)** | 0.12 (0.574) | 0.24 (0.319) | 0.002 (0.904) |
| October | 0.26 (0.242) | 0.48 (0.127) | 0.09 (0.552) | 0.01 (0.881) |
| November | **0.79 (0.008)** | 0.08 (0.536) | 0.31 (0.254) | 0.44 (0.105) |
| December | **0.60 (0.040)** | 0.36 (0.204) | 0.36 (0.206) | 0.29 (0.272) |

**Figure Caption**

**Fig. S1.** Seasonal variations of malonic (a, b), succinic (c, d), glutaric (e, f) and adipic (g, h) acids in ambient aerosol samples. The right panels are drawn based on the monthly binned concentrations of aerosol samples irrespective of years. The lower and upper whiskers represent the 10th and 90th percentiles, respectively. The outliers are excluded in the right panels to avoid any distortion in the seasonality.

**Fig. S2.** Seasonal variations of fumaric (a, b), methylmaleic (c, d) and isophthalic (e, f) acids in ambient aerosol samples. The right panels are drawn based on the monthly binned concentrations of aerosol samples irrespective of years. The lower and upper whiskers represent the 10th and 90th percentiles, respectively. The outliers are excluded in the right panels to avoid any distortion in the seasonality.

**Fig. S3.** The seasonality of total carbon (TC) normalized concentrations of oxalic acid (a, b), azelaic acid (c, d), methylsuccinic acid (e, f) and ketopimelic acid (g, h) in aerosol samples. The right panels are drawn based on the monthly binned normalized-concentrations of aerosol samples irrespective of years. The lower and upper whiskers represent the 10th and 90th percentiles, respectively. The outliers are excluded in the right panels to avoid any distortion in the seasonality.

**Fig. S4.** The seasonality of total carbon (TC) normalized concentrations of maleic acid (a, b), phthalic acid (c, d) and terephthalic acid (e, f) in aerosol samples. The right panels are drawn based on the monthly binned normalized-concentrations of aerosol samples irrespective of years. The lower and upper whiskers represent the 10th and 90th percentiles, respectively. The outliers are excluded in the right panels to avoid any distortion in the seasonality.

**Fig. S5.** The seasonality of meteorological parameters over the time period of 2001-2008 at Gosan. (a) precipitation, (b) temperature and (c) relative humidity. The lower whisker represents the 10th percentile whereas the upper whisker shows the 90th percentile. Data were obtained from Korea Meteorological Administration (KMA).