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Supplement of

Annual cycles of organochlorine pesticide enantiomers in Arctic air suggest changing sources and pathways

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Enantiomer separations by capillary gas chromatography

Enantiomer separations of α-HCH, TC and CC were carried out on Betadex-120 (BDX, 20% permethylated β-cyclodextrin in SPB-25, 30 m x 0.25 mm i.d., 0.25 µm film, Supelco, Bellefonte, PA, U.S.A.) or BGB-172 (BGB, 20% *tert*-butyldimethylsilyl-*â*-cyclodextrin in OV-1701,15 m x 0.25 mm i.d., 0.25 µm film, BGB Analytik AG, Switzerland), with detection by electron capture negative ion mass spectrometry. Instruments used were a Hewlett-Packard 5890 GC-5989 MS-Engine (Hewlett-Packard, U.S.A.) or Agilent 6890 GC-5973 Mass Selective Detector (MSD). Operating conditions were: injector (splitless, opened after 1 min) 220 ^{o}C, ion source 150^{o}C, quadrupole 100 ^{o}C, helium carrier gas at 40-60 cm s^{-1}, methane reagent gas. Temperature programs were varied according to the analytes and condition of the column. In general, slower ramp times and/or lower oven temperatures were used to improve enantiomer resolutions on aged columns. Typical programs were (Kurt-Karakus et al., 2005):

- Chlordanes on BDX: 90 °C (1 min), 15 °C min^{-1} to 150 °C, 1 °C min^{-1} to 185 °C (25 min), 20 °C min^{-1} to 225 °C (20 min).
- Chlordanes and α-HCH on BGB: 90 °C (1 min), 20 °C min^{-1} to 160 °C, 2 °C min^{-1} to 180 °C (41 min), 25 °C min^{-1} to 225 °C (15 min).
- α-HCH on BDX: 90 °C (1 min), 20 °C min^{-1} to 145 °C, 1 °C min^{-1} to 170 °C, 20 °C min^{-1} to 225 °C (15 min).

Chromatographic peaks were integrated manually at each of the two monitored ions. Target/qualifier ion ratios (IRs) for each enantiomer peak were required to fall within the 95% C.I. of IRs for standards, otherwise, the result was rejected (Kurt-Karakus et al., 2005).

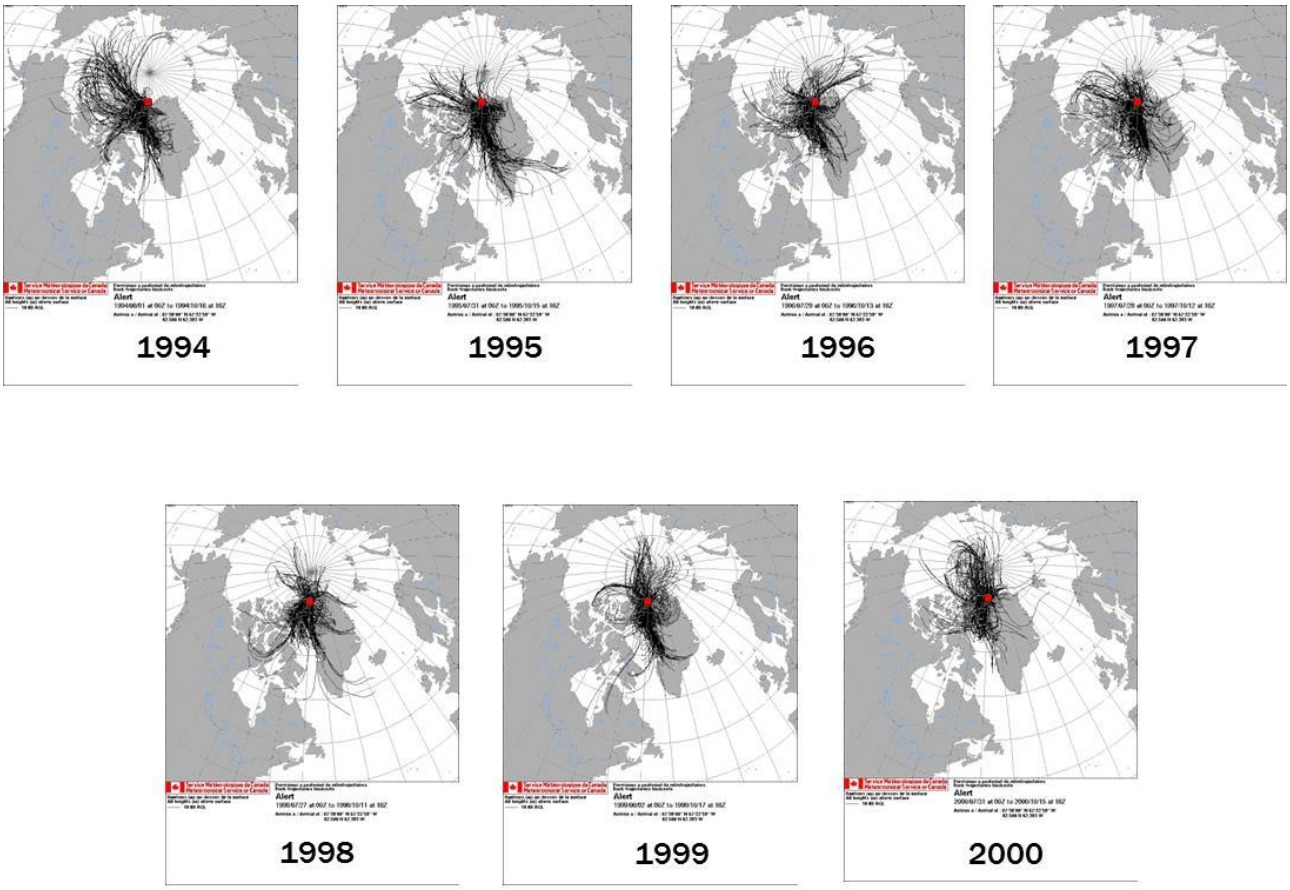

Figure S1. Air parcel trajectories 72 h backward from Alert (red square) and at 10 m height for July 31-August 1 to October 15 (weeks 31-42) (Canadian Meteorological Centre).

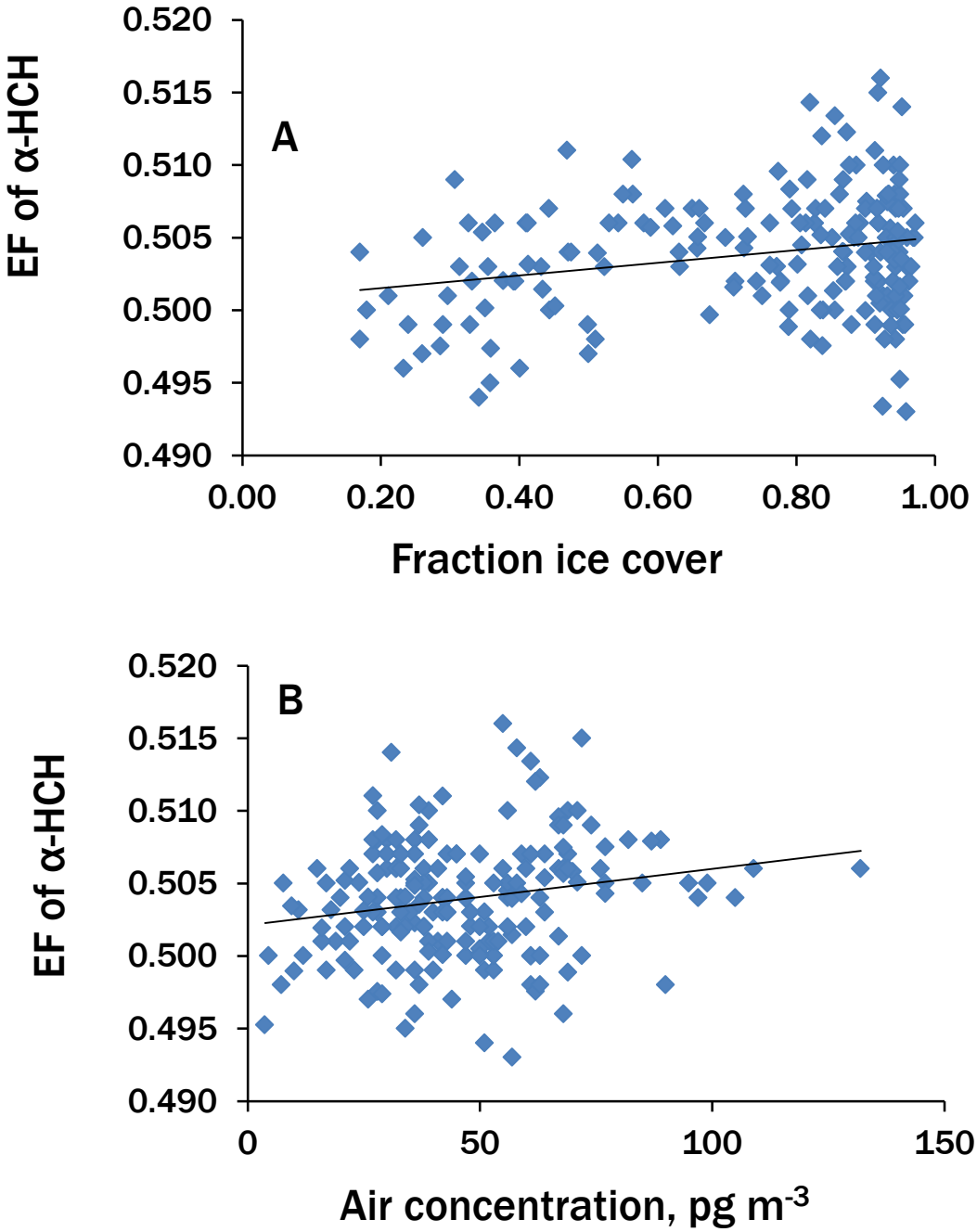

Figure S2. EFs of α-HCH versus fraction of ice cover in the Canadian Archipelago and southern Beaufort Sea (A, r^2 = 0.061) and air concentration (B, r^2 = 0.042).

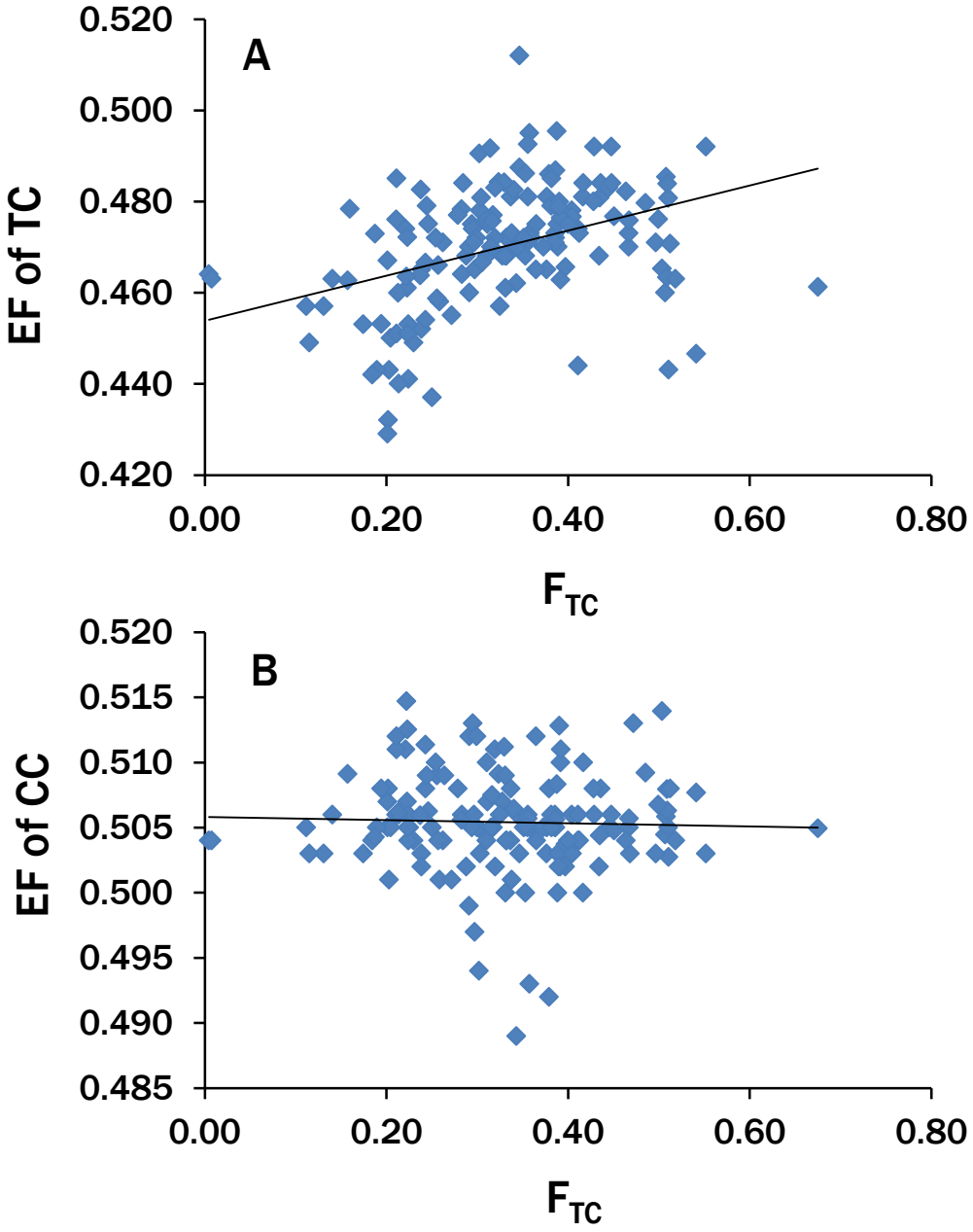

Figure S3. EFs of TC (A, r^2 = 0.16) and CC (B, r^2 = 0.0012) versus fraction of TC, F_{TC} = TC/(TC+CC).

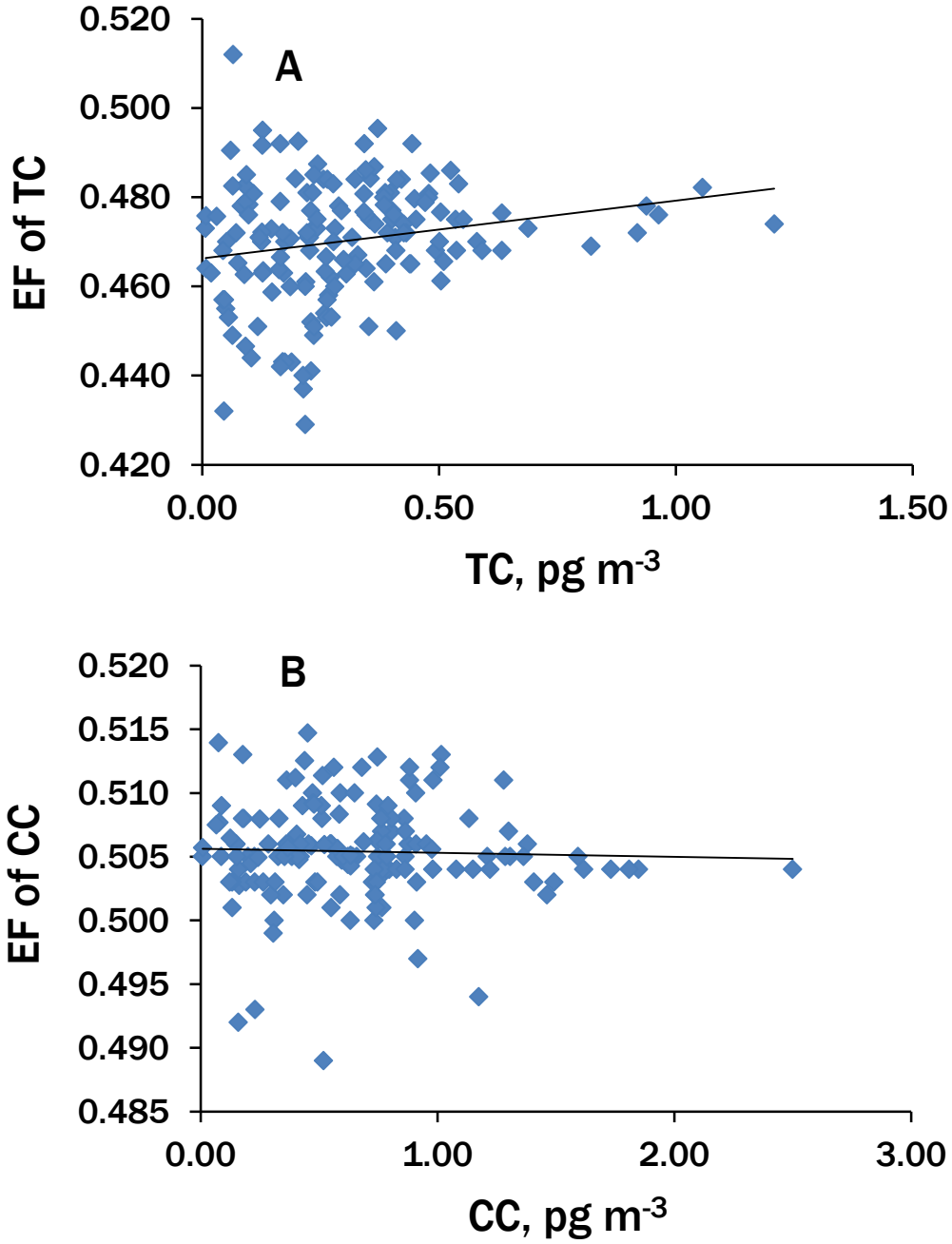

Figure S4. EFs of TC (A, r^2 = 0.039) and CC (B, r^2 = 0.0012) versus air concentrations.

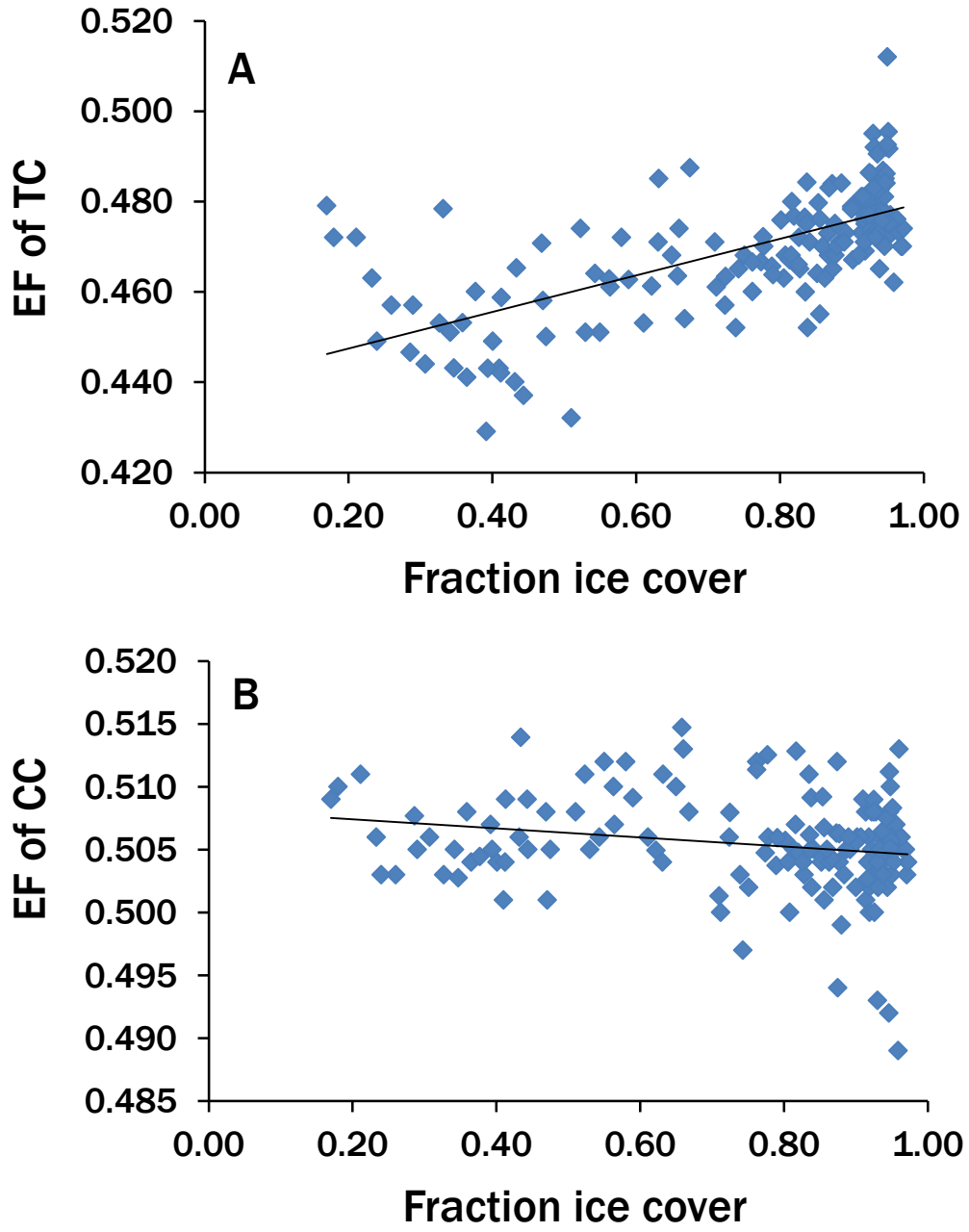

Figure S5. EFs of TC (A, r^2 = 0.44) and CC (B, r^2 = 0.044) versus fraction of ice cover in the Canadian Archipelago and southern Beaufort Sea.

Figure S6. Frequency distributions of EFs