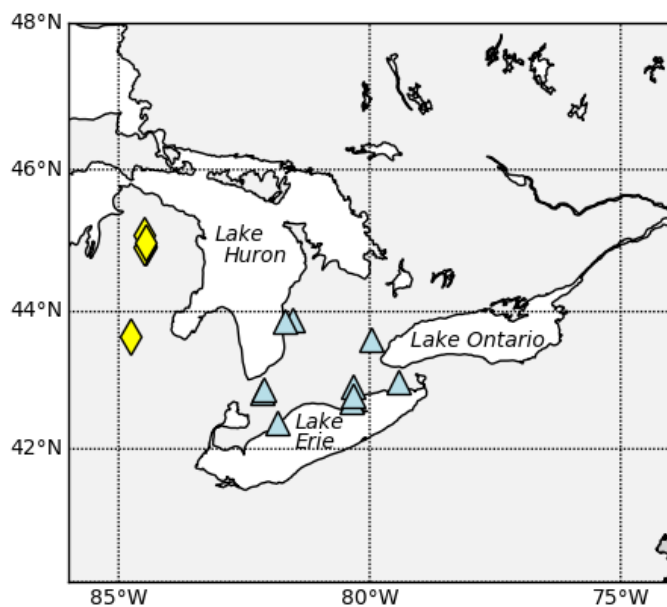
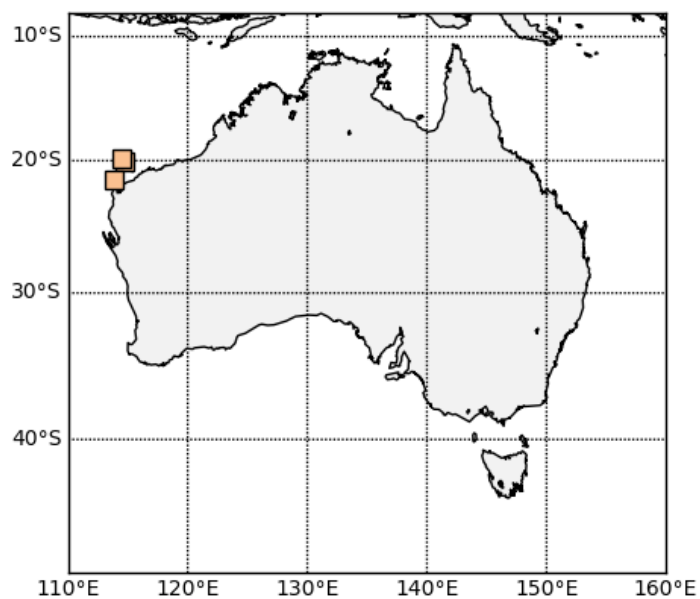
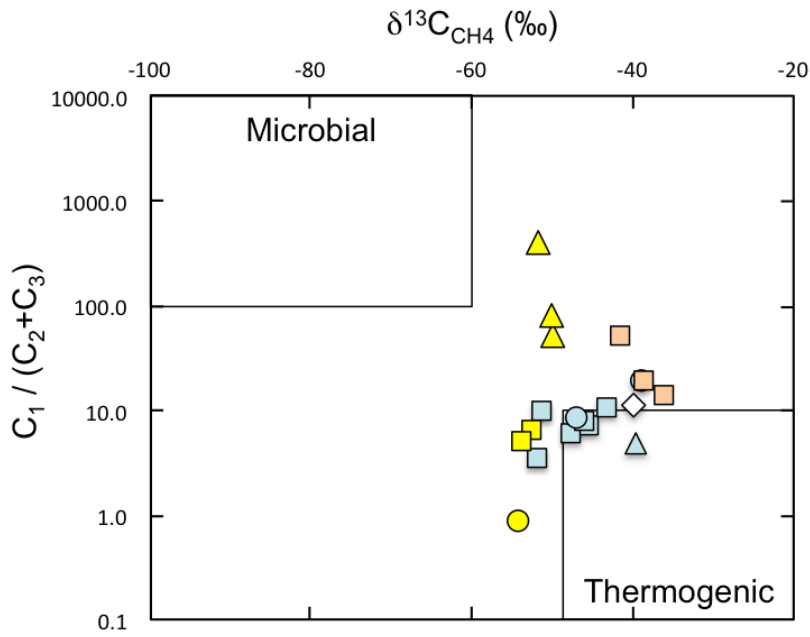


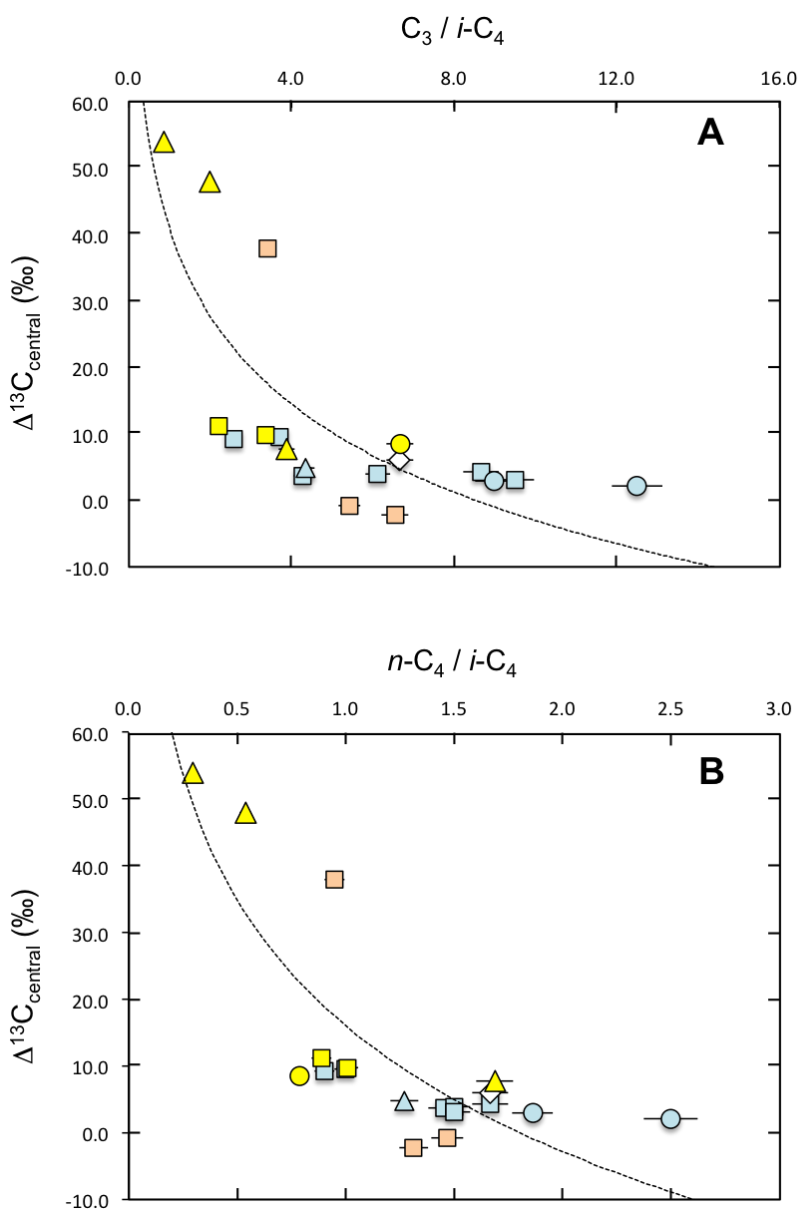
## Supplementary information



**Figure S1.** Geographical location of the samples analyzed in this work. Bottom: Southwest Ontario, Canada and Michigan Basin (USA). Top: Northern Carnarvon Basin (Australia).



**Figure S2.** Carbon isotope composition of methane  $\delta^{13}C_{CH_4}$  plotted against its relative concentration  $C_1 / (C_2 + C_3)$ . Mixing of microbially-generated hydrocarbons with the thermogenic results in shifts in the data to more  $^{13}C$ -depleted (more negative)  $\delta^{13}C$  values and  $C_1 / (C_2 + C_3) > 10$ . Symbols as in Figure 3. Error bars are smaller than the plotted symbols.



**Figure S3.** Relative  $^{13}\text{C}$ -enrichment at the central C-atom position of propane ( $\Delta^{13}\text{C}_{\text{central}}$ ) plotted against the relative chemical composition of propane (A) and *n*-butane (B) relative to *i*-butane ( $\text{C}_n/i\text{-C}_4$ ) for the 19 samples from sedimentary basins. Lines represent logarithmic correlations with a significance > 95%. The relative concentration was calculated assuming *i*-butane (*i*-C<sub>4</sub>) was not affected by biodegradation and was therefore constant. Symbols as in Figure 3.