**Supplementary Materials for**

**Organic biogeochemical study of deeper southeastern Bengal Basin sediments in West Bengal, India**

Pravat Kumar Beheraa, Supriyo Kumar Dasa\*, Devanita Ghoshb, Devleena Manic, Kalpana MSd, Minoru Ikeharae, Priyank Pravin Patelf

*aDepartment of Geology Presidency University, College Street 86/1, Kolkata-700073, India*

*bCentre for Earth Sciences, Indian Institute of Science, C.V. Raman Avenue, Bangalore- 560012, India*

*cCentre for Earth, Ocean and Atmospheric Sciences, University of Hyderabad, Telangana-500046, India*

*dNational Geophysical Research Institute, Hyderabad, Telangana – 500007, India*

*eCenter for Advanced Marine Core Research, Kochi University, B200 Monobe, Nankoku 783-8502, Japan*

*fDepartment of Geography, Presidency University, College Street 86/1, Kolkata-700073, India*

*\* Corresponding author: sdas.geol@presiuniv.ac.in*

Table S1. Age wise variation of δ13C (‰), δ15N (‰), TOC (%) and C/N (w/w) ratios in the studied wells.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Age | Well Name | Well A | | |  | Well B | | |  | Well C1 | | |  | Well C2 | | |  | Well D | | |
|  | Min | Max | Avg |  | Min | Max | Avg |  | Min | Max | Avg |  | Min | Max | Avg |  | Min | Max | Avg |
| Pleistocene | δ13C | -25.7 | -23.8 | -24.6 |  | -26.8 | -25.5 | -26.1 |  | -21.8 | -21.7 | -21.7 |  |  |  |  |  |  |  |  |
| δ15N | 3.0 | 4.4 | 3.9 |  | 3.7 | 4.0 | 3.8 |  | 4.1 | 4.4 | 4.2 |  |  |  |  |  |  |  |  |
| C/N | 4.2 | 17.3 | 7.0 |  | 8.5 | 18.0 | 13.2 |  | 5.6 | 6.1 | 5.8 |  |  |  |  |  |  |  |  |
| TOC | 0.3 | 0.9 | 0.4 |  | 0.4 | 0.8 | 0.6 |  | 0.3 | 0.3 | 0.3 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pliocene | δ13C | -25.7 | -24.7 | -25.1 |  | -26.6 | -25.1 | -26.0 |  | -25.9 | -24.7 | -25.4 |  |  |  |  |  |  |  |  |
| δ15N | 3.6 | 4.2 | 3.9 |  | 3.6 | 4.7 | 4.0 |  | 3.4 | 4.2 | 3.9 |  |  |  |  |  |  |  |  |
| C/N | 5.2 | 6.7 | 5.8 |  | 5.5 | 24.5 | 10.9 |  | 4.4 | 7.5 | 5.3 |  |  |  |  |  |  |  |  |
| TOC | 0.2 | 0.4 | 0.3 |  | 0.1 | 1.2 | 0.5 |  | 0.1 | 0.4 | 0.2 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Miocene | δ13C |  |  |  |  | -26.6 | -25.3 | -26.1 |  | -26.4 | -25.6 | -25.8 |  | -26.5 | -25.7 | -26.3 |  | -27.0 | -26.0 | -26.6 |
| δ15N |  |  |  |  | 3.6 | 4.5 | 4.0 |  | 3.3 | 4.0 | 3.6 |  | 3.5 | 4.0 | 3.8 |  | 3.5 | 4.5 | 3.9 |
| C/N |  |  |  |  | 6.6 | 13.9 | 9.3 |  | 4.7 | 31.6 | 5.6 |  | 4.9 | 41.2 | 11.4 |  | 5.4 | 34.0 | 14.4 |
| TOC |  |  |  |  | 0.2 | 0.6 | 0.4 |  | 0.1 | 1.4 | 0.3 |  | 0.1 | 2.3 | 0.5 |  | 0.2 | 1.5 | 0.7 |

Table S2. Age wise variation of CPI-1, CPI-2 and TAR in the studied Bengal Basin samples.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Age |  | CPI-115-19 | | |  | CPI-225-33 | | |  | TAR | | |
|  | Min | Max | Avg |  | Min | Max | Avg |  | Min | Max | Avg |
| Pleistocene |  | 1.40 | 1.40 | 1.40 |  | 1.22 | 1.22 | 1.22 |  | 0.57 | 0.57 | 0.57 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pliocene |  | 0.85 | 1.53 | 1.19 |  | 0.91 | 0.92 | 0.91 |  | 0.09 | 0.15 | 0.12 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Miocene |  | 1.46 | 0.91 | 1.12 |  | 0.81 | 1.21 | 1.09 |  | 0.23 | 0.99 | 0.46 |

CPI-1 =½×(((C15+C17+C19)/(C14+C16+C18)) + ((C15+C17+C19))/(C16+C18+C20)))

CPI-2=½×(((C25+C27+C29+C31+C33)/(C24+C26+C28+C30+C32)) + ((C25+C27+C29+C31+C33)/(C26+C28+C30+C32+C34)))

TAR = (C27+C29+C31)/ (C15+C17+C19)