

## Distinctive marine ecosystem during the Cretaceous Oceanic Anoxic Event 1b revealed from aryl isoprenoids in sediments from the Vocontian Basin, SE France

TAKUTO ANDO<sup>1</sup>, KEN SAWADA<sup>1</sup>, KAZUKI OKANO<sup>1</sup>,  
REISHI TAKASHIMA<sup>2</sup> AND HIROSHI NISHI<sup>2</sup>

<sup>1</sup>Faculty of Science, Hokkaido University, Sapporo, Japan.  
e-mail: tact@mail.sci.hokudai.ac.jp

<sup>2</sup>Tohoku University Museum, Tohoku Univ., Sendai, Japan.

Aromatic biomarker analysis is performed in sediments from the Goguel (OAE1a), Jacob, Kilian, Paquier (OAE1b), Breistroffer (OAE1d) and Thomel (OAE2) levels in the Vocontian Basin, SE France. C<sub>21</sub> Aryl isoprenoids are abundantly detected in sediments from the Jacob, Kilian and Paquier levels. Moreover, long chain aryl isoprenoids such as 1-(6,10-dimethylundecan-2-yl)-4-methyl-2-(3, 7, 11, 15-tetramethyl-hexadecyl)-benzene (DMTB) are particularly identified from the Paquier sediments. Adam *et al.* (2006) [1] reported that the DMTB was likely to be formed by degradation of lycopene skeleton from freshwater microalgae *Botryococcus braunii* race L. The DMTB was presumably experienced cyclisation and aromatization after cleavage from tail-tail linked isoprenoids such as lycopenes cross-linking within geomacromolecule. The long chain aryl isoprenoids including C<sub>21</sub> are presumably originated from DMTB. Kuypers *et al.* (2002) [2] and Okano *et al.* (2008) [3] suggested that marine ecosystem in the OAE1b was characterized by archaea-dominant production from higher abundance of aliphatic isoprenoid hydrocarbons (PMI, TMI and ETMI). Also, the tail-tail linked aryl isoprenoids including C<sub>21</sub> can be formed from the PMI-like isoprenoid skeletons within geomacromolecule. We point out two possible origins of the PMI (TMI and ETMI) in the Kilian and Paquier samples; 1) archaeal lipids, and/or 2) fragments from lycopene skeletons within geomacromolecule. Carbon isotope ratios of PMI are higher in black shale layers of the Paquier level. This result may be attributed to high production of PMI-producing algae with blooming rather than archaeal production.

[1] Adam *et al.*, 2006, *Organic Geochemistry* **37**, 584-596. [2] Kuypers *et al.*, 2002, *Palaeo3* **185**, 211-234. [3] Okano *et al.*, 2008, *Organic Geochemistry* **39**, 1088-1091.