# Carbon dioxide emission during OAE 1a from the oil reservoir in Brazilian offshore

*Akihiro Kano[1]

1.Graduate School of Social and Cultural Studies, Kyushu University

Development of a huge oil field has been unveiled in Brazilian offshore during the last decade. It consists of ~150 m thick porous carbonate distributed in an area of half Honshu, which was formed in ~1 million years. Depositional setting was likely a saline lake developed in the onset of continental rifting between South America and Africa. However, laminated texture and rapid depositional rate are supportive alternative view that it was deposited from carbonate spring (travertine). Since this discovery, travertine researchers have been focusing the origin of this carbonate oil reservoir. The Brazilian carbonate rock comprises a huge carbon mass of $1.23 \times 10^{19}$ mole, when we take the porosity and the carbonate content similarly 50%.
Travertine is a rapid $CO_2$-degassing system as well as a carbonate-depositing system. Our results in Japan and Indonesian travertines indicated the degassing surpassed the carbonate deposition with G/P ratio of 7-18. When we introduce this to the carbon mass of the Brazilian carbonate, the degassed $CO_2$ is calculated $1.2\text{-}2.7 \times 10^{15}$ ton as carbon, which is equivalent to 2-5% of crustal inorganic carbon of Berner (1990). If the degassing had occurred in a period of 1 myr, the average degassing rate corresponds to 14-32% of the modern emission from fossil fuel.
Depositional age of the Brazilian carbonate was 123 Ma during the Ocean Anoxic Event (OAE) 1a. The most likely climatic background was warming due to increase in $CO_2$ concentration, and its potential source might be superplume forming the Pacific oceanic rises or accelerated volcanism in subduction zones. However, an enormous degassing from the Brazilian carbonate calculated here could be more than a candidate trigger of OAE 1a if it was a travertine system.

Keywords: Cretaceous, OAE, carbon dioxide

 