Chronology and sedimentation of hyper salinity lake(Meedee lake) in the eastern Mediterranean

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In the Mediterranean Sea, an evaporite rock accumulated was formed by Messinian Salinity Crisis during 5.33 to 6Ma(this event that the Mediterranean Sea was in isolation from the Atlantic, and desiccation) (krijgsmann et al., 1999).Saline materials exudes from the evaporate rock and forms ultra high salinity brine lake in the basin. In this brine lake, it is a unique environment that salinity contents more than 300 psu which is equal to about 10 times of the seawater and low dissolved O_2. Five brine lakes have ever discovered in the eastern Mediterranean, Microbiological research has well studied in these lakes. The main purpose of this study is to reveal sedimentary environment of new discovery brine lake. From the survey of research group in KH06-4 cruise, reverse fault was formed by tectonic motion with subduction. This fault reaches in evaporite rock which was dissolved by pore water. High salinity pore water elevates to seafloor along the reverse fault. As a result, brine lake was formed at depression in seafloor.

A piston core was collected in the edge of this lake with observation of ocean floor by using Navigable Sampling System during the KH06-4 cruise (latitude:34'27.02N, longitude:22'16.61E, W.D.:2920m, core length:293.5cm). The core consists of a calcareous ooze. No sedimentation structure is observed by a visual description and X-rays CT scan. Alternation of the dark color band (yellowish orange) and the light color band (grayish white) was observed in several cm scale. The boundary of each band changes in gradual or sharp, indicating of defferent change in sedimentary environments different. After cutting half the whole core, non-destructive measurements were conducted(magnetic susceptibility / digital color ; $*$L $*$a $*$b/ color image / X-ray CT scanning). After cubes were sampled from the core continuously, water content and sand fraction (more than 0.063mm) were calculated. Two planktonic foraminifers were picked up and measured stable isotope using mass spectrometry. Benthic foraminifers were picked up about 200 individuals and Benthic Foraminifer Number(BFN)/g was calcurated

Age was determined by AMS^{14}C age of planktonik foraminifer (*G. inflata*) and the d^{18}O of planktonik foraminifer (*G. ruber*) correlation to the standard oxygen isotope curve of from the Vostok ice core. This core covers about 50 to 220 kyr. and the average sedimentation rate is calculated about 2.0cm/kyr. Deposition time of each band was calculated in average several thousand years.

About sedimentary environment, the surface sediment inside of brine lake shows white color and outside shows dark color from the observation of NSS. Pyrite found only in light color band. Average number of BFN/g in dark color band is about 260 and diversity is high. Average value of BFN/g in light color light color band is about 128 and diversity is low. In addition, two type species which are tolerate low oxygen (*Staintiforthia complanata*) and tolerate high salinity (*Articulina tubulosa*) contains high frequent in light color band. As above results, dark color band and light color band were deposited in oxidation and reduction environment, respectively.

From comparison of the vales between d^{18}O of *G. ruber* and L$*$,the light color band was correspond to the interglacial periods and the dark color band was correspond to the glacial period. The changes in oxidation-reduction environment is caused by : (1) the core was recovered from the edge of brine lake, (2) surface of brine lake was elevated by inflow of pore water was limited by strength of bottom current corresponding to the period of glacial-interglacial in the eastern Mediterranean Sea. When color changes were occurred sharply and $*$L values did not correspond with d^{18}O, it might be a sudden change of the topography with tectonic motions or following injection of the pore fluid from the deep.