

**Paleoenvironmental
reconstructions for the
Bonaparte Gulf, Australia
using ^{14}C age differences
between molluscs and organic
matter**

TAKESHIGE ISHIWA^{1*}, YUSUKE YOKOYAMA²,
YOSUKE MIYAIRI³, MINORU IKEHARA⁴, STEPHEN
OBROCHTA⁵, TAKENORI SASAKI⁶, AKIHISA
KITAMURA⁷

¹Department of Earth and Planetary Science, the
University of Tokyo (*correspondance:
t_ishiwa@aori.u-tokyo.ac.jp)

²Atmosphere and Ocean Research Institute, the
University of Tokyo (yokoyama@aori.u-
tokyo.ac.jp)

³Atmosphere and Ocean Research Institute, the
University of Tokyo (miyairi@aori.u-tokyo.ac.jp)

⁴Center for Advanced Marine Core Research, Kochi
University (ikehara@kochi-u.ac.jp)

⁵Faculty of International Resource Sciences, Akita
University (obrochta@gipc.akita-u.ac.jp)

⁶The University Museum, the University of Tokyo
(sasaki@um.u-tokyo.ac.jp)

⁷Faculty of Science, Shizuoka University
(seakita@ipc.shizuoka.ac.jp)

Radiocarbon dating is an essential dating methods for late Quaternary samples. Further, ages of different material preserved in a same horizon of geological strata could provide paleoenvironmental information. We define the age differences between molluscs and organic matter as “ ^{14}C age offset”, which can be an indicator of relative terrigenous carbon contributions to the sediments deposited at certain period in the past. The Bonaparte Gulf, northwestern Australia, has a broad continental shelf with the water depth shallower than ~200 m. This region has a carbonate platform, which had been exposed during sea level lowstand. Here we present the paleoenvironmental reconstructions in the Bonaparte Gulf, using ^{14}C age offset combined with other geochemical and geophysical proxies.

The variation of ^{14}C age offset is correlated with TOC, C/N ratios, and Ca/Ti. The increased terrigenous carbon contributions make an organic matter age older and change ^{14}C age offset larger. These variations suggest that the paleoenvironmental change as the exposure of carbonate platforms occurred at ca. 26 ka. We concluded that the application of ^{14}C age differences between molluscs and organic matter ages is useful in the reconstruction of paleoenvironmental change in this region.