

## Holocene marine radiocarbon reservoir age in the Taiwan Strait

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Marine reservoir age is necessary for calibrating radiocarbon ages of carbonate samples such as corals, mollusks, or planktonic foraminifera. The marine radiocarbon reservoir age (R) not only would vary temporally, but would also vary spatially with local oceanographic and climatic conditions. Therefore, the regional/local marine reservoir age correction ( $\Delta R$ ) is generally applied when calibrating marine radiocarbon ages. Although there were quite a few marine reservoir age data for the western Pacific, information from the Taiwan Strait is still limited. Therefore, we collected and analyzed fossil coral samples from the Penghu Islands to reconstruct Holocene R record in the Taiwan Strait. Our results show that for the past ~6700 years, the R values for the Taiwan Strait showed a high-variation period before ~5.5 ka and a more stable period after 5.5 ka. At about 3.5 and 1.4 cal kyr BP, the R value of the Penghu area was clearly lower. These patterns are mostly similar to records from the South China Sea and the South Equatorial Pacific. Based on our results, we calculated a Holocene  $\Delta R$  value of  $-146 \pm 61$  14C yr of the Taiwan Strait area, to be used with the MARINE 20 database. This value is substantially different from previous reports of  $\Delta R$ , and points out that published  $\Delta R$  data need to be recalculated for more accurate marine radiocarbon calibrations.

Keywords: marine reservoir age; radiocarbon dating; MARINE 20 database; Penghu Islands; Taiwan Strait